8-12REPORT DOCUMENTATION PAGE

AFRL-SR-AR-TR-06-0046

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
1/31/2006	~~Annual~~ Final Report	1 Mar. 2000 – 30 Nov. 2005

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Research Evaluation Management Services for The Chemistry and Life Sciences Program	F49620-00-C-0009
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
Judith M. Flory	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PEFORMING ORGANIZATION REPORT NUMBER
UES, Inc. 4401 Dayton-Xenia Road Dayton, OH 45432-1894	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Air Force Office of Scientific Research Directorate of Chemistry and Life Science Arlington, VA 22203-1954 NL	10. SPONSOR/MONITOR'S ACRONYM(S) 11. SPONSORING/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

During the performance of this contract UES, Inc. provided research evaluation services for the Chemistry & Life Sciences Directorate, Air Force Office of Scientific Research in areas that include Neurosciences, Computer Sciences, Computer Sciences, Otolaryngology, Meteorology, Chemistry, Biotechnology and Fuels and in related program under development. Evaluations were secured for 68 research proposals. Three program reviews were held in the areas of Molecular Dynamics & Theoretical Chemistry, BioInspired Concepts (BIC) Theme and Biomimetic and Biomaterial & Biointerfacial Sciences. Three workshops were held in the areas of Culture & Personality in Models of Adversarial Decision-Making, Cell-Like Entities (CLE), and Dip-Pen Nanolithography (DPN). One panel meeting was held in Molecular Dynamics & Theoretical Chemistry.

15. SUBJECT TERMS

Neurosciences, Molecular, Dynamics, Perception, Cognition, Chronobiology, DipPen, Nanolithography Biomimetic, Biomaterial, Biointerfacial

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	Unclassified	Unclassified		52	19b. TELEPHONE NUMBER (Include area code) (937)426-6900

Standard Form 298 (Rev 8/98)
Prescribed by ANSI Std. 239.18

Final
~~ANNUAL~~ REPORT

CHEMISTRY AND LIFE SCIENCES RESEARCH PROGRAM

CONTRACT NO. F49620-00-C-0009

Period of Performance: 3/1/00 – 11/30/05

Prepared For:

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

CHEMISTRY AND LIFE SCIENCES DIRECTORATE

Dr. Genevieve Haddad, Program Manager

Presented By:

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

Table of Contents

INTRODUCTION

UES, Inc. is providing research evaluation services to the Directorate of Chemistry and Life Sciences, Air Force Office of Scientific Research (AFOSR), in sub areas that include Neurosciences (e.g., Neurochemistry, Biology, Electrophysiology, Neuroanatomy, Multisensory Integration/Spatial Orientation, Cardiovascular Physiology, and Bioenvironmental Hazards; Psychophysics, Psychophysiology, Physiological Psychology, Sensation, Perception, Cognition); Computer Sciences (e.g., Vision and Robotics); Otolaryngology; Meteorology, Chemistry (e.g., computational chemistry, polymeric and organic materials, photonic materials, inorganic and surface chemistry, high density materials); Biotechnology (e.g., materials and processes); and Fuels (e.g., petroleum and synthetic); and in related programs under development.

The services provided by UES, Inc. include: selecting qualified scientists to evaluate proposals, assembling scientific groups to evaluate, analyze and advise on content and direction of Chemistry and Life Sciences Programs; organizing workshops to assist in the definition of new basic research areas proposed by the Chemistry and Life Sciences Directorate; providing advisors to make presentations and assist government personnel with analyzing areas of relevant science; and providing advisors to assist and advise on site visits to research laboratories.

The fourth option year included:143 Proposals Reviewed, 7 Program/Contractor Reviews, 4 Workshops, 2 Panel Meetings and 1 Conference.

A. Evaluations of Individual Research Proposals

UES mailed 143 proposals to evaluators during the performance period of 1 March 2004 through 30 November 2005.

UES has been providing the Director of Chemistry and Life Sciences a Summary of Proposals under Review (SPUR) report on a biweekly basis. This report is now being sent electronically as well as a hard copy. This report is composed of the UES log sheet indicating the proposals sent out, the names of the evaluators to whom the proposals were sent, the dates the proposals were mailed, the tickle date, any necessary comments, and the date the reviews were received. This allows the Program Managers to have a current listing of all proposal activity.

B. Contractor/Program Reviews

1. Cognition Program Review 9-10 March 2004

2004 AFOSR Polymer Matrix Composites, Long Beach, CA, 21-22 May 2004. The review was held at the Hyatt Regency Long Beach Hotel. UES provided on-site support, abstract booklets and made all arrangements for the review. ($2,387)

Dr. Charles Lee, Program Manager

Total Attendance:	48
Speakers:	25
Attendees:	23

B. **Contractor/Program Reviews** - continued

2. **2004 AFOSR Tribology Program Review,**
3-5 November 2004, Lowes Annapolis Hotel, Annapolis, MD. UES provided on- site support, abstract booklets and made all arrangements for the review. ($5,147)

Major Jennifer Gresham, Program Manger

Total Attendance:	60
Speakers:	24
Attendees:	36

3. **AFOSR MURI Review**, 4-5 November 2004, Hope Hotel, Wright-Patterson AFB, OH. UES provided on-site support and made all arrangements for the review. ($525)

Total Attendance:	31
Speakers:	15
Attendees:	16

4. The fifth program review was the **2005 Biomimetic, Biomaterial & Biointerfacial Sciences**, Shelter Pointe Hotel, Shelter Point, CA, 16-21 January 2005. UES provided on-site support, abstract booklets and made all arrangements for the review. ($4,300)

Dr. Hugh De Long, Program Manager.

Total Attendance:	50
Speakers:	31
Attendees:	29

5. The sixth program review was the **2005 AFOSR Electrochemistry Program Review**, the Churchill Hotel, Washington, DC, 23 March 2005. UES provided abstract booklets and made all arrangements for the review. ($2,229)

Dr. Jennifer Gresham, Program Manager

Total Attendance:	56
Speakers:	13
Attendees:	43

6. The seventh program review was the **2005 AFOSR Cognition Program Review, Hilton Historic Bayfront Hotel**, St. Augustine, FL, 18-19 April 2005. UES provided on-site support, abstract booklets and made all arrangements for the review. ($12,896)

Dr. Robert Sorkin, Program Manager

Total Attendance:	56
Speakers:	20
Attendees:	36

7. **AFOSR STTR Review**, Wyndham Hotel, Albuquerque, NM, 11 May 2005. UES made all arrangements for the review. ($979.96)

Dr. Charles Lee, Program Manager
Total Attendance:
Speakers
Attendees

8. **2005 Polymer Matrix Composites Program Review**, Sheraton Suites Hotel, San Diego, CA. 8-12 August 2005. UES provided on-site support, abstract booklets and made all arrangements for the review. ($14,596)

Dr. Charles Lee, Program Manager
Total Attendance: 146
Speakers: 78
Posters: 21
Attendees: 47

C. Workshops

1. **AFOSR Contractor's Review on Ionic Liquids Research**, Tampa, FL, 7-8 March 2004. Review was held at the Tampa Marriott Westshore Hotel. Fifteen scientists gave presentations regarding their grant proposal in this area. There were a total of 27 attending this review. UES made all arrangements for the review. ($600)

Dr. Michael Berman, Program Manager
Total Attendance: 27
Speakers: 15
Attendees: 12

:

2. **AFOSR Workshop on Information Fusion**, Clarion Hotel Stockholm, Stockholm, Sweden, 30 June 2004. Refreshments provided. ($805.97)

Dr. John Tangney, Program Manager

3. **2005 AFOSR Computer Information Sciences Workshop**, Savoy Restaurant Rome, NY, 15-19 August 2005. UES provided on-site support and made all arrangements for the workshop. ($3,763)

Dr. John Tangney & Dr. Robert Herklotz, Program Managers
Total Attendance:
Speakers:
Attendees:

4. **Workshop on Multifunctional Materials**, Keystone Resort, Keystone, C0, 21-26 August 2005, ($868)

Major Jennifer Gresham, Program Manager
Total Attendance:
Speakers: 44
Attendees:

D. **Panel Meeting**

1. **Molecular Dynamics & Theoretical Chemistry Panel Meeting**, Marriott Hotel, Dulles, VA, 10 June 2004. ($866)
   Dr. Michael Berman, Program Manager
   Number of Panel Members Present: 7

2. **Molecular Dynamics & Theoretical Chemistry Panel Meeting**, Marriott Hotel, Dulles, VA, 15 June 2005. ($733)
   Dr. Michael Berman, Program Manager
   Number of Panel Members Present: 7

E. **Conference**

1. AFOSR Conference on Culture & Adversary Modeling, Hilton Palacio del Rio Hotel, San Antonio, TX, 29 November – 1 December 2005. ($12,896)
   Dr. John Tangney, Program Manager
   Total Attendance: 189
   Speakers: 42
   Attendees: 147

F. **Advisors**

In addition to advisors provided for Program Reviews, Workshops and Panel Meetings, UES provided travel, per diem and in many cases, honorarium for the following advisors:

Charles Wight, **Ionic Workshop**, Tampa, FL
7-8 March 2004
($491.70 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Whitman Richards, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($987.87 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Rick DeShon, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
(Declined Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Zygmunt Pizlo, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($696.63 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Robert Sekuler, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($1,017.38 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

David Weiss, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($580.30 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

James Shanteau, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
(Declined Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Brian J. Stankiewica, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($816.17 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Robert Steinman, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($835.67 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Advisors – continued

Bradly Love, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($961.06 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Wayne Gray, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($962.05 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Verlin Hinsz, **Cognition & Decision Making Workshop**, Chandler, AZ
9-10 March 2004
($1,009.36 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Steven Sibener, **Molecular Dynamics & Theoretical Chemistry Contractors Meeting**, Newport, RI
23-26 May 2004
($1,210.26 Reimbursement for Expenses)
Dr. Michael Berman

Edmond Murad, **Molecular Dynamics & Theoretical Chemistry Contractors Meeting**, Newport, RI
23-26 May 2004
($950.88 Reimbursement for Expenses)
Dr. Michael Berman

Carlos Pinedo, **MIT Research, AFRL/HEPG,** Wright-Patterson AFB, OH
2-3 June 2004
($382.76 Reimbursement for Expenses)
Dr. Willard Larkin, Program Manager

Charles Oman, **MIT Research, AFRL/HEPG,** Wright-Patterson AFB, OH
2-3 June 2004
($410.76 Reimbursement for Expenses)
Dr. Willard Larkin, Program Manager

Laurence Young, **MIT Research, AFRL/HEPG,** Wright-Patterson AFB, OH
2-3 June 2004
($571.98 Reimbursement for Expenses)
Dr. Willard Larkin, Program Manager

James Lisy, **Molecular Dynamics & Theoretical Chemistry Panel Meeting**, Dulles, VA
10 June 2004
($524.15 Reimbursement for Expenses, $802.00 Honorarium)
Dr. Michael Berman, Program Manager

Advisors – continued

Bruce Garrett, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
($652.00 Reimbursement for Expenses, $802.00 Honorarium Paid)
Dr. Michael Berman, Program Manager

Albert Wagner, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
($410.35 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Mark Johnson, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
($446.45 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

David Chandler, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
($587.85 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Robert Whetten, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
($505.21 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Ann Chaka, **Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
10 June 2004
(Declined Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Da-Ren Chen, **2004 MURI Kick-Off Meeting on Relationship between Physicochemical Characteristics and Toxicological Properties of Nanomaterials**
University of Rochester, Rochester, NY
13-15 July 2004
($542.05 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Advisors - continued

Mengdawn Chen, **2004 MURI Kick-Off Meeting on Relationship between Physicochemical Characteristics and Toxicological Properties of Nanomaterials**
University of Rochester, Rochester, NY
13-15 July 2004
Dr. Walter Kozumbo, Program Manager

Vicki Colvin, **2004 MURI Kick-Off Meeting on Relationship between Physicochemical Characteristics and Toxicological Properties of Nanomaterials**
University of Rochester, Rochester, NY
13-15 July 2004
($1,010.22 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

David Y.H. Pui, **2004 MURI Kick-Off Meeting on Relationship between Physicochemical Characteristics and Toxicological Properties of Nanomaterials**
University of Rochester, Rochester, NY
13-15 July 2004
($1,174.22 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Juergen Pohlmann, **MDA Polymer Technology Demonstration Radar Beam Steering**, Austin, TX
9 September 2004
($673.46 Reimbursement for Expenses)
Dr. Charles Lee, Program Manger

Wesley Henderson, **14th International Symposium on Molten Salts**, Honolulu, HI
3-8 October 2004
($2,997.66 Reimbursement for Expenses)
Dr. Paul Trulove, Program Manager

Douglas Fox, **14th International Symposium on Molten Salts**, Honolulu, HI
3-8 October 2004
($4,298.52 Reimbursement for Expenses)
Dr. Paul Trulove, Program Manager

Errol Zeiger, **AFOSR Jet Fuel Toxicology Workshop**, Tucson, AZ
13-15 October 2004
($1,054.38 Reimbursement for Expenses, $2,406.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Ashok Kumar, **AFOSR Tribology Program Review**, Annapolis, MD
3-5 November 2004
($1,030.52 Reimbursement for Expenses)
Major Jennifer Gresham, Program Manager

Advisors - continued

Peter Schmidt, **AFOSR Tribology Program Review**, Annapolis, MD
3-5 November 2004
(Declined Reimbursement for Expenses)
Major Jennifer Gresham, Program Manager

Terence Risby, **Jet Fuel Workshop**, Kettering, OH
16-17 November 2004
($664.89 Reimbursement for Expenses, $802.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Errol Zeiger, **Jet Fuel Workshop**, Kettering, OH
16-17 November 2004
($809.15 Reimbursement for Expenses, $2,005.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

W. Kent Anger, **Jet Fuel Workshop**, Kettering, OH
16-17 November 2004
($1,041.83 Reimbursement for Expenses, $401 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

John Reynolds, **Attend Scientific Meeting,** Boston, MA
29 November – 3 December 2004
($2,036.10 Reimbursement for Expenses)
Dr. Charles Lee, Program Manager

Steven Forrest, **Attend Scientific Meeting,** Boston, MA
29 November – 3 December 2004
($1,363.20 Reimbursement for Expenses)
Dr. Charles Lee, Program Manager

Xiang-Gen Xia, **Rome Laboratory Advisor**, Rome, NY
8-9 December 2004
($414.94 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Fredericus VanKuijk, **Kick off Meeting**, Houston, TX
16 December 2004
($2,353.51 Reimbursement for Expenses, $401.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Edward Pugh, **AFOSR Funded Study of Laser Flash Blindness at AFRL,** Brooks AFB, TX
8 January 2005
(Declined Reimbursement for Expenses)
Dr. Willard Larkin, Program Manager

Advisors – continued

Rick Blum, **AFRL/Rome Laboratory,** Rome, NY
8 January 2005
($387.63 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Paul Osenar, **AFOSR Electrochemistry Review**, Washington, DC
23 March 2005
($723.29 Reimbursement for Expenses)
Major Jennifer Gresham, Program Manger)

Bruce Garrett, **AFOSR Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
14 June 2005
($685.53 Reimbursement for Expenses, $802 Honorarium Paid)
Dr. Michael Berman

James Lisy, **AFOSR Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
14 June 2005
($595.66 Reimbursement for Expenses, $802 Honorarium Paid)
Dr. Michael Berman

Ann Chaka, **AFOSR Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
14 June 2005
(Declined Reimbursement for Expenses)
Dr. Michael Berman

Albert Wagner, **AFOSR Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
14 June 2005
($521.20 Reimbursement for Expenses)
Dr. Michael Berman

Arthur Suits, **AFOSR Molecular Dynamics & Theoretical Chemistry Panel Meeting,**
Dulles, VA
14 June 2005
($403.39 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Randy Seeley, **AFRL-HE/AFOSR Workshop,** Wright-Patterson AFB, OH
15 June 2005
($238.65, Reimbursement of Expenses, $150.00 Honorarium Paid)
Dr. Willard Larkin, Program Manager

Advisors – continued

Mehdi Adineh, **AFRL-HE/AFOSR Workshop,** Wright-Patterson AFB, OH
15 June 2005
($38.25 Reimbursement of Expenses, $150.00 Honorarium Paid)
Dr. Willard Larkin, Program Manager

Frank Robb, **AFRL-HE/AFOSR Workshop,** Wright-Patterson AFB, OH
15 June 2005
($467.69 Reimbursement of Expenses, $401.00 Honorarium Paid)
Dr. Willard Larkin, Program Manager

Edouard Assam, **AFOSR-HE Workshop**, Wright-Patterson AFB, OH
15 June 2005
($660.13 Reimbursement of Expenses, $401.00 Honorarium Paid)
Dr. Willard Larkin, Program Manager

Randy Seeley, **AFRL-HE Workshop**, Wright-Patterson AFB, OH
15 June 2005
($88.65 Reimbursement for Expenses, $150.00 Honorarium Paid)
Dr. Willard Larkin, Program Manger

D. M. Fox, **EUCHEM Molten Salts Conference,** Piechowice, Poland
19-24 June 2005
($2,814.86 Reimbursement for Expenses)
Dr. Paul Trulove, Program Manager

R. Schultz-Friedrich, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
($1,446.75 Reimbursement for Expenses, $600.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Michael Maroney, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
($783.58 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Ben Hankamer, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
(Declined Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Roger Prince, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
($223.25 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Advisors – continued

Simon P.J. Albracht, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
($1,895.57 Reimbursement for Expenses, $600.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Oliver Lenz, **Bio-Solar Hydrogen MURI Kickoff Meeting,** Princeton, NJ
20 June 2005
($1,754.15 Reimbursement for Expenses, $600.00 Honorarium Paid)
Dr. Walter Kozumbo, Program Manager

Jerome Busemeyer, **Visit with Dr. Sorkin on Possible IPA Appointment**, Arlington, VA
14-15 July 2005
($443.48 Reimbursement for Expenses)
Dr. Robert Sorkin, Program Manager

Peter Kofinas, **Polymer Matrix Composites Program Review**, San Diego, CA
7-13 August 2005
($1,718.90 Reimbursement for Expenses)
Dr. Charles Lee, Program Manager

Vladimir Lefebvre, **Conference on Culture and Adversary Modeling**, San Antonio, TX
29 November – 1 December 2005
($939.04, Reimbursement for Expenses)
Dr. John Tangney, Program Manager

SUMMARY

UES is pleased to have performed the specific tasks assigned to them in accordance with provisions of the contract. Participants were Dr. Mike Livingston as Program Manager, Judith M. Flory, Program Manager and Amiee Nichols as Program Assistant. UES personnel are appreciative opportunity they had to be of service to AFOSR in this interesting and worthwhile program.

LIST OF APPENDICES

BREAKDOWN OF RESEARCH PROPOSALS BY PROGRAM MANAGER

PROGRAM MANAGER	NO. OF PROPOSALS
Berman	42
De Long	10
Kozumbo	13
Larkin	19
Lee	34
Sorkin	17
Tangney	2
Trulove	6

AFOSR Contractor's Review on Ionic Liquids Research

March 7 & 8, 2004
Tampa Marriott Westshore
813-287-2555
Tampa, FL

Sunday March 7

9:00 Introduction and Welcome Mike Berman/Greg Drake
9:10 Greg Drake "Update of Synthetic Efforts at AFRL"
9:40 Robin Rogers (U. Alabama) "Synthesis of Ionic Liquids"
10:10 Jean'ne Shreeve (U. Idaho) "Synthesis of Ionic Liquids"

10:40 Break

11:00 Alan Katritzky (U. Florida) presented by Robin Rogers "Synthetic Efforts in New Ionic Liquids"
11:20 Jeff Bottaro/Mark Petrie (SRI Intl.) "New Species for Ionic Liquids"
11:40 John Wilkes (USAF Academy) "Thermal Properties of Ionic Liquids"

12:10 Lunch Break

1:00 Thomas Litzinger/Stefan Thynell (Penn State University) "Studies of EMIM nitrate"
1:30 Tomas Baer (U. North Carolina) "Rapid evaporation mass spectrometry of aerosolized ionic liquids"
2:00 Bill Larson/Angelo Alfano/Ghanshyam Vaghjiani (AFRL) "Ignition efforts of Ionic Liquids"
2:30 Chuck Wight (U. Utah) "Oscillations Reactions during Thermal Decomposition of Ionic Liquids"
2:50 Jerry Boatz/Jeff Mills(AFRL) "Computational Studies of Ionic Liquids"

3:15 Break

3:30 Greg Voth (U. Of Utah) "Modeling of ionic liquid properties"
4:00 E. Maginn (Notre Dame) "Molecular Modeling of Solute-Solvent Interactions in Ionic Liquids"
4:30 Mark Gordon (Iowa State) "Theoretical/Computational Studies of Ionic Liquids"
5:00 Don Thompson (Oklahoma State) "Modeling of ionic liquid melts"

6:30 Dinner (No Host)

Monday March 8

8:30 – 11:00 Round Table discussions

2004 Polymer Matrix Composite Review
Hyatt Regency Long Beach
200 South Pine Avenue
Long Beach, CA

21-22 May 2004

21 May (Friday)

0715 Registration and Continental Breakfast (Regency Ballroom B & C)

0755 Welcome/Introduction
Charles Lee, Air Force Office of Scientific Research, Arlington, VA

0800 Developments in High Frequency Dielectric Techniques for Non Destructive Evaluation
Richard Pethrick and David Hayward, University of Strathclyde, Glasgow, Scotland, UK

0830 Water-network Interactions in Adhesive Joints and the Assessment of Joint Quality
Jovan Mijovic, Polytechnic University, Brooklyn, NY

0900 Advanced Material Development for Polymer Matrix Composites I; HTRTM (Hyperbranch Additions), E- Beam Processing & Transitions
Fred Arnold, AFRL/MLBCO, Wright-Patterson AFB, OH

0930 Advanced Material Development for Polymer Matrix Composites II; Nanosilicates & Transitions
Fred Arnold, AFRL/MLBCO, Wright-Patterson AFB, **OH**

1000 Break

1015 The Structure-Processing-Performance Relations of High Temperature Polymers and Their Composites
Roger J. Morgan, Texas A&M University, College Station, TX

1045 In-Situ Chemical Kinetic Characterization and Modeling of EB Cured Thermoset Polymers and the Design of Improved Material Systems
Giuseppe R. Palmese, Drexel University, Philadelphia, PA

1115 Developments of Real-Time EB Cure Characterization Techniques and Their Application
Giuseppe R. Palmese, Drexel University, Philadelphia, PA and Donald Klosterman, University of Dayton Research Institute, Dayton, OH

1145 Polynanomeric Matrix Interlayer Composite Systems
James C. Seferis, University of Washington, Seattle WA

21 May (Friday) continued

1215 Lunch (Hyatt Regency, Regency Ballroom B & C)

1315 Electrospinning of Nanofibers for Composite Laminates
Yuris Dzenis and Xiangfa Wu, University of Nebraska, Lincoln, NE

1345 High Temperature Thermoset Nanocomposites
Derrick R. Dean, Tuskegee University, Tuskegee, AL

1415 Structure/Property Relationship of Organically Modified Layered Silicate/ Resin Matrix
Dharmaraj Raghavan, Howard University, Washington, DC

1445 Nanocomposites Containing Carbon Nanofiber, Treated Clay or Polyhedral Silsesquioxane Nanophases
Charles U. Pittman, Jr., Mississippi State University, Starkville, MS

1515 Break

1530 Modeling Long-Term Behavior of High Temperature Polymer Matrix Composites
Gregory Schoeppner, Oishore Pochiraju and Erik Ripberger, AFRL/MLBC, Wright-Patterson AFB, OH

1600 Automated Composite Microstructural Analysis as a Basis for Determination of Stochastic Variation in Structural Performance
Gregory P. Dillon, Pennsylvania State University, State College, PA

1630 Processing-Interphase-Property Relationships in the Curing of Thermosetting-matrix Composites
Ranga Pitchumani, University of Connecticut, Storrs, CT

1700 Process Analysis and Adaptive Control of Resin Transfer Molding
Robert Minaie, University of South Alabama, Mobile, AL

22 May (Saturday)

0730 Registration and Continental Breakfast (Regency Ballroom B & C)

0800 Nanoscale Intralaminar Reinforcement for Bismaleimide Composites
Margaret Roylance, Foster-Miller, Inc., Waltham, MA

0830 Multi-functional Nanocomposite Materials with High Temperature Polymer Resin Matrices
Ranji Vaidyanathan, Advanced Ceramics Research, Tucson, AZ

0900 The Introduction of a Nanophase for Carbon Fiber-Reinforced Polymer Matrix Composites: Processing and Characterization
James H. Koo, Texas A&M University, College Station, TX

0930 Thermo-Oxidative Aging of Nanoparticle Filled Cyanate Ester Composites
Apoorva Shah, Triton Systems, Inc., Chelmsford, MA

1000 Break

1015 Investigation of Adhesive Joints for Nano-Engineering and Modeling
Chris H. Jenkin and Robb Winters, South Dakota School of Mines & Technology, Rapid City, SD

1045 Nanocomposite Rocket Ablative Materials (NRAM) Summary
Gary Beall, Texas State University, San Marcos, TX

1115 Improved Oxidation Resistant Carbon-Carbon Composites
Radha Agarwal and Harry Katz, Utility Development Corporation, Livingston, NJ

1145 The Development of Nanomodified Carbon/Carbon Composites for Intermediate Temperatures (700° – 1,200°F)
Joseph H. Koo, Texas A&M University, College Station, TX

1215 End

2004 AFOSR Tribology Program Review
Annapolis Maryland
3-5 Nov 2004

Wednesday, 3 November (Ballroom)

1130 – 1215 Registration

Tribology Core Programs

1215 – 1230 **Introduction**
Jennifer Gresham, AFOSR

1230 – 1300 **Lubrication Mechanisms of Doped Solid Lubricants: MoS_2/Sb_2O_3/graphite**
J. S. Zabinski, B.S. Phillips, J. J. Hu, J. E. Bultman, and J. H. Sanders,
Air Force Research Laboratory, Wright-Patterson Air Force Base, Dayton, OH

1300 – 1330 **Synthesis of Nano Structured Solid Lubricants for Advanced Coatings**
Ajay P. Malshe, University of Arkansas, Fayetteville, AK

1330 – 1400 **Laser Processing of "Chameleon" Tribological Surfaces**
A. A. Voevodin, J. G. Jones, C. Muratoree, and J. S. Zabinski, Air Force Research, Wright-Patterson Air Force Base, Dayton, OH

1400 – 1430 **Break**

1430 – 1500 **Tribological Relevance of the Surface Chemical Reactivity of Metal Carbides**
Scott. S. Perry, University of Houston, Houston, TX

1500 – 1530 **Metal Carbide Surface Chemistry Modeling using Density Functional Theory**
Stephen V. Didziulis, The Aerospace Corporation, El Segundo, CA

1530-1600 **Vapor Phase Lubrication of Gold/Gold Interfaces**
Scott. S. Perry, University of Houston, Houston, TX

1730 – 1930 **Reception/Poster Session Powerhouse Building**

Thursday, 4 November (Ballroom)

0730 – 0800 **Registration/Continental Breakfast**

0800 – 0830 **Molecular-Scale Tribology of Solid Lubricants for MEMS Applications**
Judith Harrison, US Naval Academy, Annapolis, MD

0830 – 0900 **Micro/Nanotribology of RF MEMS Switches**
S. T Patton[1], K. C. Eapen[1], and J. S. Zabinski[2], (1) University of Dayton Research Institute, Dayton, OH, (2) Air Force Research, Wright-Patterson Air Force Base, Dayton, Ohio

0900 – 0930 **SPM Studies of Linear Chain Alcohols as Potential Lubricants for MEMS Devices: A Fundamental Approach**
J. Nainaparampil[1], K. C. Eapen[2], S. Smallwood[3], and J. S. Zabinski[1], (1) Air Force Research, Wright-Patterson Air Force Base, Dayton, OH, (2) University of Dayton Research Institute, Dayton, OH, (3) Universal Technology Corporation, Dayton, OH

0930 – 1000 **Break**

Tribology MURI Programs

1000 – 1030 **Introduction to the North Carolina State/UC Irvine/Naval Academy Extreme Environment Tribology MURI Program**
Jacqueline Krim, North Carolina State University, Raleigh, NC

1030 – 1115 **Silicon and RF MEMS Contact Tribology**
Angus Kingon[1], Jacqueline Krim[1], Don Brenner[1], and Mike Dugger[2], (1) North Carolina State University, Raleigh, NC, (2) Sandia National Laboratory, Albuquerque, NM

1115 – 1245 **Lunch** (on your own)

1245 – 1315 **Terrestrial Applications: High Temperature and Moist/Dry Environments**
Robert Nemanich[1], Mohammed Zikry[1], Kathy Wahl[2], and, Jeff Zabinski[3] (1) North Carolina State University, Raleigh, NC, (2) Naval Research Laboratory, Washington, DC, (3) Air Force Research, Wright-Patterson Air Force Base, Dayton, OH,

1315 – 1345 **Space, Cryogenic and Vacuum Environments**
Peter Taborek[1], Judith Harrison[2], and Jim Rutledge[1], (1) University of California-Irvine, Irvine, CA, (2) U.S. Naval Academy, Annapolis, MD

1345 – 1415 **Introduction to the UF-RPI MURI Research Group**
W. Gregory Sawyer, University of Florida, Gainesville, FL

1415 – 1430 **Break**

Friday, 5 November - continued

1430 – 1500 **Polymer and Precursor Derived Ceramic Composites**
Leonard V. Interrante, Rensselaer Polytechnic Institute, Troy, New York

1500 – 1530 *Carbon Nanotube Structures*
P. M. Ajayan, Rensselaer Polytechnic Institute, Troy, New York

1530 – 1600 **Microtribology of Aligned Arrays of Multi-Walled Carbon Nanotubes**
W. Gregory Sawyer, University of Florida, Gainesville, FL

Friday, 5 November (Ballroom)

0900-0930 **Continental Breakfast**

0930 – 1000 **Design of High Vacuum Tribometers Using Multi-Axis Load Cells and Flexures**
John C. Ziegert, University of Florida, Gainesville, FL

1000 – 1030 **Ultra-Low Wear Polymeric Composites of PTFE & PEEK**
W. Gregory Sawyer, University of Florida, Gainesville, FL

1030 – 1100 **Molecular Dynamics Simulations of PTFE Transfer Films**
Simon R. Phillpot, University of Florida, Gainesville, FL

1100 – 1130 **Wrap-up**

AFOSR MURI Review
(F49620-02-1-0381)

Multidimensional Surface-Enhanced Sensing and Spectroscopy

Program Review Meeting
November 4-5, 2004
Hope Hotel & Conference Center, Bldg 823, Area A, WPAFB OH 45433-5000

Agenda for Thursday, November 4, 2004

8:30 - 8:40	Michael Berman, AFOSR Welcome Remarks
8:40 - 8:55	Richard Van Duyne, Northwestern University "Overview of the MURI on Multidimensional Surface-Enhanced Sensing and Spectroscopy"
8:55 - 9:05	Janet Jensen – ARL "TBA"
SESSION IA	**Chair: Kathy Rowlen**
9:05 - 9:35	Richard Van Duyne, Northwestern University "Surface-Enhanced Raman Sensors"
9:35 - 10:05	Shuming Nie, Emory University "Surface-Enhanced Raman Probes for Spectroscopic Tagging of Single Cells"
10:05 - 10:35	Break
10:35 - 11:05	Louis Brus, Columbia University "Electromagnetic Field Enhancement and Optical Forces at Junctions between Large Ag Nanocrystals"
11:05 - 11:35	Richard Van Duyne, Northwestern University "Single Nanoparticle Sensing and Spectroscopy"
11:35 - 12:05	George Schatz, Northwestern University "Nanoparticle Electrodynamics and Electronic Structure Studies of SERS"
12:05 - 1:20	**Lunch**
SESSION IB	**Chair: Shuming Nie**
1:20 - 1:30	Paul Pellegrino, ARL
1:30 - 2:00	Kathy Rowlen, University of Colorado "Surface-Enhanced Raman Spectroscopy on Nanoaperture Arrays"
2:00 - 2:30	Paul Bohn, University of Illinois at Urbana-Champaign "Growth of Self-Limiting Atom-Scale Metal Junctions for Electronic and Optical Sensing of Lewis Base Adsorbates"

2:30 - 3:00 Break

SESSION II **Chair: Alan Campion**

3:00 - 3:30 Alan Campion, University of Texas at Austin
"Raman Microscopy and Raman NSOM; Chemical Imaging on the Submicron Length Scale"

3:30 - 4:00 Richard Van Duyne, Northwestern University
"Tip-Enhanced Raman Spectroscopy: Materials and Instrumentation"

4:00 - 4:30 Lukas Novotny, Rochester University
"TBA"

4:30 - 5:00 Naomi Halas, Rice University
"TBA"

5:00 - 6:30 Poster Session (posters stay up until Friday AM)

6:30 Adjourn for Dinner

Agenda for Friday, November 5, 2004

SESSION III **Chair: David Jonas**

9:00 - 9:30 Ken Spears, Northwestern University
"Second Harmonic Excitation Spectroscopy of Ag Nanoparticle Arrays"

9:30 - 10:00 David Jonas, University of Colorado
"Two-Dimensional Spectroscopy Leads to New Insight into SERS"

10:00 - 10:30 Gilbert Chang, Postdoc (Schatz), Northwestern University
"FDTD calculations on nanohole arrays"

10:30 - 11:00 **Break**

SESSION IV **Chair: Richard Van Duyne**

11:00 - 11:10 Dept of Homeland Security Participant (or other govt participant)
"TBA"

11:10 - 11:20 NIH Speaker (or other government speaker)

11:20 - 11:40 Discussion

11:40 - 11:50 Concluding Remarks
Richard Van Duyne, PI

11:50 -12:00 Concluding Remarks
Michael Berman, AFOSR

Biomimetic, Biomaterial and Biointerfacial Sciences Program Review

Shelter Pointe Hotel & Marina

Shelter Pointe, CA

16-21 January 2005

Sunday, 16 January 2005 Registration and Reception, 5:00 to 7:00 PM

Monday, 17 January 2005

0830 Opening Remarks – Hugh De Long
Air Force Office of Scientific Research, AFOSR/NL

Silk

0845 ***Processing and Structural Analysis of Silk Films***
Rajesh R. Naik, Air Force Research Laboratory, MLPJE

0925 ***Ionic Liquid Processing and Characterization of Silk***
Robert A. Mantz, Air Force Research Laboratory, MLPJE

1005 Break

1035 ***Nanomechanics of Biopolymers***
Kathryn J. Wahl, Naval Research Laboratory

1115 ***Predicting the Mechanical Properties of Silk***
David Porter, Oxford University

1215 Lunch

1930 ***Transgenic silk moths to produce spider silk***
Rene Herrera, Florida International University

2010 ***Films of Electrospun Silk Containing Green Fluorescent Protein (GFP)***
Ronald K. Eby, the University of Akron

Tuesday, 18 January 2005

0830 ***Silk Protein Block Designs for Improved Expression and Materials Processing***
David Kaplan, Tufts University

0910 ***Spider Silk as a Material***
Randolph Lewis, University of Wyoming

0950 **Break**

Thermal Sensors

1020 ***Development of an Ultra-Lightweight and Uncooled Protein/Polymer Thermal Sensor Array***
Rajesh R. Naik, Air Force Research Laboratory, MLPJE

1100 ***A Long-Range Attraction Between Aggregating 3T3 Cells Mediated By Near-Infrared Light Scattering***
Guenter Albrecht-Buehler, Northwestern University

1140 ***Toward the Engineering of a Mechanically Activated Nanosensor***
Paul Blount, University of Texas

1220 **Lunch**

1930 ***Infrared Sensory Systems in Pyrophilous Insects***
Helmut Schmitz, Bonn University

2030 ***Novel Biomimetic MEMS Based Infrared Sensor***
Lei Zhang, Agiltron

Wednesday, 19 January 2005

Chromophores

0830 ***Optical, Biochemical, and Molecular Characterization of New Bioluminescence Systems***
Dimitri Deheyn, Scripps Institution of Oceanography, UC-San Diego

0910 ***Characterization and Mutagenesis Studies to Develop Novel Bioluminescent Systems***
Bruce Branchini, Connecticut College

0950 ***Break***

Directed/Self Assembly

1020 ***Characterization and Analysis of DNA Immobilization on Surfaces***
Lloyd J. Whitman, Naval Research Laboratory

1100 ***Biomimetic Tribological Systems: Molecular-Level Design of Low Friction Surfaces***
Scott Perry, University of Houston

1140 **Lunch**

1930 ***Ultra-Sensitive and Selective Chip-Based Detection of DNA***
Chad Mirkin, Northwestern University

2010 ***Surface-Templated Bio-Inspired Synthesis and Fabrication of Nanomaterials***
Mark Ratner, Northwestern University

Thursday, 20 January 2005

0830 ***Self-Assembling Biological Structures with Engineered Functionalities***
Rajesh Naik, Air Force Research Laboratory, MLPJE

0910 ***Bio-Inspired and Bio-Directed Self-Assembly of Porous and Composite Nanostructures***
C. Jeffrey Brinker, University of New Mexico

0950 ***Break***

1020 ***Free-Suspended Flex Nanomembranes as Highly-Sensitive Sensors***
Vladimir V. Tsukruk, Iowa State University

1100 ***Design and Development of Nanoscale Biomotor Power Units***
Richard C. Holz, Utah State University

1140 ***Combinatorial Analysis of Functional Interfaces and Surfaces Generated Via Dip-Pen Nanolithography***
Thomas B. Higgins, Harold Washington College

1220 ***Lunch***

1930 ***Front-End Processing of Cell Lysates for Enhanced Chip-Based Detection and Analysi***
James W. Schneider, Carnegie Mellon University

2010 ***S-layer Templated Nanoparticle and Carbon Nanotube Arrays***
Dietmar Pum, Universitat fur Bodenkultur

Friday, 21 January 2005

0830 ***Direct Nanoscale Conversion of Bio-Molecular Signals into Electronic Information***
Jimmy Xu, Brown University

Biominerialization

0920 ***Biomimetic Synthesis of Inorganic Materials***
Rajesh Naik, Air Force Research Laboratory, MLPJE

1000 **Break**

1030 ***Chemically-Tailored 3-D Nanoparticle Structures by the BaSIC Process***
Kenneth H. Sandhage, Georgia Institute of Technology

1110 ***Studies of Biosilicification: The Role of Proteins, Carbohydrates and Model Compounds in Structure Control***
Carole C. Perry, The Nottingham Trent University

1150 **End**

2005 AFOSR Electrochemistry Program Review

The Churchill Hotel, Washington D.C.
23 March 2005

0700 – 0730 Registration and continental breakfast

0730 – 0740 **Introduction**
Jennifer Gresham, AFOSR

Sensing (Biological, Chemical, Physical)

0740 – 0820 **Microdevices for Biomolecular Detection**
Scott Manalis, Massachusetts Institute of Technology

0820 – 0900 **High Gain Optical Sensing at the Nanoscale**
Daniel Nocera, Massachusetts Institute of Technology

0900 – 0940 **Functionalized Hybrid Structures for Detection and Delivery**
SonBinh Nguyen, Northwestern University

0940 – 1000 **Break**

1000 – 1040 **Nanowire Nanophotonics: Nanoscience and Emerging Technologies**
Charlie Lieber, Harvard University

1040 – 1120 **Artificial Haircell Sensors and Sensitive Skin**
Chang Liu, University of Illinois, Champaign-Urbana

1120 – 1300 **Lunch** (on your own)

Compact Power and Fuel Cell Technologies

1300 – 1340 **Self-Organization of Electrochemical Devices from Heterogeneous Colloids**
Yet-Ming Chiang, Massachusetts Institute of Technology

1340 – 1420 **Building New Structures from Nanorod Arrays: Polymer Membranes and Tubes and Their Application Toward Ion Conduction**
John Arnold, University of California-Berkeley

1420 – 1500 **NMR Transport Studies of Neutral and Charged Species in Fuel Cell Membranes**
Steve Greenbaum, Hunter College-CUNY

1500 – 1520 **Break**

1520 – 1600 **Development of a New Generation of Hybrid Membranes for Fuel Cell Applications**
Emmanuel Giannelis, Cornell University

1600 – 1640 **Molecular Modeling and Experimental Validation of Transport and Electrocatalysis Processes in PEMFCs**
Xiangyang Zhou and George Philippidis, Florida International University

Miscellaneous Surface Science

1640 – 1720 **Use of Optical Probes and Laser Scanning Confocal Fluorescence Microscopy for High Throughput Characterization of Dispersion in Nanocomposites**
Jeff Gillman, NIST

1720 – 1800 **Strong Emission of Broad Visible Light from ZnO Nanowires**
Jie Liu, Duke University

1800 – 1820 **Wrap-up (PM and Reviewers only)**

2005 AFOSR Cognition Program Review
18-19 April 2005

Hilton Historic Bayfront Hotel,
St. Augustine, FL

Monday, 18 April 20058

1330 Opening Remarks – G. Haddad and R. Sorkin
Air Force Office of Scientific Research, AFOSR/NL

1345 Perceiving Geometry: Distortions of Visual Space Explained by Natural Scene Statistics
D. Purves, Duke University

1415 Computational Models of Orientation and Navigation in Virtual Environments
G. Gunzelmann and D. Lyon Air Force Research Laboratory

1445 Break

1500 From Navigating When Disoriented to Seek and Disrupt: Understanding the Cognitive Limitations in Sequential Decision Making with Uncertainty
B. Stankiewicz, University of Texas

1530 Towards a New Computational Model of Human Thinking and Problem Solving
Z. Pizlo, Purdue University

1600 Inference in Dynamic Environments
M. Steyvers, University of California, Irvine

1530 A Unified Model of Advice Acquisition and Usage
R. Sorkin, University of Florida

1700 Adjourn

1800 Reception – Menendez Grand Ball Room

Tuesday, 19 April 2005

0830 Computational Cognitive Modeling of Adaptive Choice Behavior
W. Gray, Rensselaer Polytechnic Institute

0900 The Economics of Cognition; Resource Allocation in Simple Command and Control Decision Tasks
A. Wearing, University of Melbourne

0930 Designing Networks against Rational and Irrational Enemy Action
C. Smith, University of Arizona

1000 Break

Tuesday, 19 April 2005 - continued

1015 Models of Collective Choice
W. Richards, Massachusetts Institute of Technology

1045 Dynamic Resource Allocation and Adaptability in Teamwork
S. Kozlowski, Michigan State University

1115 Acquisition and Retention of Team Coordination in Command-and-Control: Data, Metrics, and Models
N. Cooke, Arizona State University

1145 Lunch

1300 Modeling Team Performance in Simulated Aircraft Task Environments
V. Hinsz, North Dakota State University

1330 Development and Testing of Intelligent Agents for Distributed Team Training
W. Shebilske, Wright State University

1400 There Really Are "I"s in Team
D. Weiss, California State University

1430 Break

1445 Cluster-based Modeling of Human Learning: Joint Influences of Task and Environment
B. Love, University of Texas

1515 Using an Optimal Model of Task Performance to Guide Training in a National Missile Defense (NMD) Task
B. Best, MAAD, Ltd

1530 Automated Intelligent Training System – Building the Expert Domain
R. Lathon, EMT, Incorporated

1545 UPDATE: Usability Problem Data Analysis Technology, and MOST: Model-based Optimal System for Training
J. Freeman, Aptima, Incorporated

1630 Usability Engineering with the Software Therapist, a Latent Semantic Analysis-Based Problem Solving Environment
R. Sparks, Pearson Knowledge Technologies

1645 Closing Discussion

2005 Polymer Chemistry & Polymer Matrix Composite Reviews
Sheraton Suites
San Diego, CA

8-13 August 2005

8 August (Monday)

0715 Registration and Continental Breakfast

0750 Welcome/Introduction

Charles Lee, Air Force Office of Scientific Research, Arlington, VA

0800 New Generation Materials and Structures for Nanophotonics and Nanoelectronics
Paras Prasad, University of Buffalo, Buffalo, NY

0900 Smart Skin MURI

Larry Dalton, University of Washington, Seattle, WA

0930 STW 21- Photonic Polymers
Frank Harris, University of Akron, Akron, OH

1000 Photonic Polymers
Loon-Seng Tan, Air Force Research Laboratory, Wright-Patterson AFB, OH

1030 Break

1045 Polymer Nanocomposites for RF Antenna Applications
Max Alexander, Air Force Research Laboratory, Wright-Patterson AFB, OH

1115 Application of Organic Materials to 3D Optical Circuitry
George Stegeman, University of Central Florida, Orlando, FL

1145 Synthesis and Studies of New Non-Destructive Readout Materials for Rewritable Optical Storage and Optical Switches
Peter Renzetpis, University of California, Irvine, CA

1215 Polynanomeric Matrix Interlayer Composite Systems

Paras Prasad, University of Buffalo, Buffalo, NY

1245 Lunch

1400 Applications of Organic Materials in Warfighter Effectiveness
Darrel Hopper, Air Force Research Laboratory, Wright-Patterson AFB, OH

8 August (Monday) continued

1430 High Performance Photorefractive Polymer Composites
Nasser Peyghambarian, University of Arizona, Tucson, AZ

1500 Search For Better Photorefractive And Photovoltaic Materials
Luping Yu, University of Chicago, Chicago, IL

1530 Break

1600 Diffractive Wavefront Control with Spatial Light Modulators: Components, Applications, Analysis and Demonstrations
Mark Gruneisen, Air Force Research Laboratory, Kirtland AFB, NM

1615 Bio-inspired Organic/Inorganic Hybrid Electronic and Photonic Materials and Structures
Alex K-Y. Jen, University of Washington, Seattle, WA

1645 The Realization of New and Enhanced Materials Through Nanostructural Control
Larry Dalton, University of Washington, Seattle, WA

1715 Novel Wavelength Selective Switch Based On Electro-Optic Polymer Microrings
Antao Chen, University of Washington, Seattle, WA

1745 end

9 August (Tuesday)

0750 Registration and Continental Breakfast

0800 Progress in Electronic Polymers
Douglas Dudis, Air Force Research Laboratory, Wright-Patterson AFB, OH

0830 Electro-Optical Properties Of Polymer Blends: Lasing, Electroluminescence And Photophysics
Frank Karasz, University of Massachusetts, Amherst, MA

0900 Molecularly Engineered Chromophores of π-Conjugated Polymers for Probing Structure-Charge Injection/Luminescence Relationship, and for Improved Optical Properties
Yi Pang, Clark Atlanta University, Atlanta, GA

0930 Two Photon Porphyrin Core Dendrimers For Optical Power Limiting
Alexander Rebane, Montana State University, Bozeman, MT

1000 Break

1015 Visible Initiators for Thiol-ene Based HPDLCs
Tim Bunning, Air Force Research Laboratory, Wright-Patterson AFB, OH

1045 Development Of Multifunctional Ultra-Nonlinear Liquids And Liquid Crystals for Sensor Protection Applications
I. C. Khoo, Pennsylvania State University, University Park, PA

1115 Programmable Triplet Formation and Decay In Metal-Organic Chromophores
Felix N. Castellano, Bowling Green State University, Bowling Green, OH

1145 Starburst Fullerene-Chromophore Conjugates for Multi-photon Absorption Applications
Long Chiang, University of Massachusetts Lowell, Lowell, MA

1215 Lunch

1330 Electrospinning of Nanofibers for Composite Laminates
Fazio Nash, Air Force Research Laboratory, Rome, NY

1400 Platinum Acetylide Materials for Optical Limiting
Kirk Schanze, University of Florida, Gainesville, FL

1430 Optical, Electronic, and Thermal Properties of Polymer Nano-Composites
Carroll, Wake Forrest University, Wake Forrest, NC

1500 Towards Active Optical Wavefront Control Using Photoactive Polymers
Joe Ritter, University of Hawaii, Kula, HI

1530 Break

1545 Electro-Optic Materials / DNA Photonics
Richard Hopkins, Air Force Research Laboratory, Wright-Patterson AFB, OH

1615 Conductive Liquid Crystalline Elastomer for Aircraft Gap Treatment
Richard Hreha, Cornerstone Research Group, Dayton, OH

1645 Separation of Carbon Nanotubes
Fotios Papadimitrakopoulos, University of Connecticut, Storrs, CT

1715 High Performance Polymer Electronic Devices: Polymer Leds, Solar Cells and Memory Devices
Yang Yang, University of California, Los Angeles, CA

1745 end

10 August (Wednesday)

0750 Registration and Continental Breakfast

0800 Organic-Based Photovoltaic Devices
Michael Durstock, Air Force Research Laboratory, Wright-Patterson AFB, OH

0830 Nanoscale Polymeric Solar Cells with Transparent Carbon Nanotube Electrodes
Anvar Zakhidov, University of Texas At Dallas, Richardson, TX

0900 Very High Performance Organic Photonic Devices
Stephen Forrest, Princeton University, Princeton University

0930 "Plastic" Optoelectronics: Injection Lasers Fabricated from Soluble Semiconducting Polymers and Bulk Heterojunction Solar Cells Fabricated from Soluble Semiconducting Polymers
Alan Heeger, University of California, Santa Barbara, Santa Barbara, CA

1000 Break

1015 Opportunities In Photovoltaics For Space Power Generation
Paul Hausgen, Air Force Research Laboratory, Kirtland AFB, NM

1045 Development of High Efficiency, Low-Cost Flexible Dye-Sensitized Solar Cells [i]
Michael Graetzel, Laboratory of Photonics and Interfaces, Lausanne, Switzerland

1115 High Mobility Polymer Semiconductors
Samson A. Jenekhe, University of Washington, Seattle, WA

1145 Optimized Variable Gap Conjugated Polymers
John Reynolds, University of Florida, Gainesville, FL

1215 Lunch

1330 Radiation Effects In Organic Semiconductor Based Thin Film Transistors
Roderick Devine, Air Force Research Laboratory, Kirtland AFB, NM

1400 Organic Solar Cells Using Star Conductive Polymers
Fei Wang, EIC Laboratories, Inc., Norwood, MA

1430 Intermolecular Charge-Transfer Complexes in Conjugated Polymer Solar Cells
Dmitry Paraschuk, Moscow State University, Moscow, Russia

10 August (Wednesday) continued

1500 Break

1530 Flexible Thin-Film Transistors
Bijan Radmard, Triton Systems, Inc., Chelmsford, MA

1615 Carbon Nanotube Based Transistors and Opto-Electronic Devices
Koene, Luna,

1645 High Mobility Stable Crosslinked Conductive Polymer
Fei Wang, EIC Laboratories, Inc., Norwood, MA

1715 Organic Based Flexible Transistors and Electronic Devices
Klaus Dimmler, Organic, Colorado Springs, CO

1745 end

11 August (Thursday)

0750 Registration and Continental Breakfast

0800 Virus Based Metal-Organic Ordered Nanostructures
Edwin Thomas, Massachusetts Institute of Technology, Cambridge, MA

0830 Agile Response Coatings
Carroll, Wake Forrest University, Wake Forrest, NC

0900 Application of Low-loss RF Polymer Composite Materials
Leo Kempel, Air Force Research Laboratory, Wright-Patterson AFB, OH

0930 Photoinduced Magnetism in Molecule-Based Magnets
Arthur Epstein, the Ohio State University, Columbus, OH

1000 Break

1015 Organic Polymers with Magneto-Dielectric Properties
Andrzej Rajca, University of Nebraska, Lincoln, NE

1045 Block Copolymer Nanoarchitectures for Radio Frequency Applications
Peter Kofinas, University of Maryland, College Park, MD

1115 Polymer Nanocomposites: Enhancing Performance and Imparting Adaptivity through the Interface
Richard Vaia, Air Force Research Laboratory, Wright-Patterson AFB, OH

1145 Microstructure, Processing and Mechanical Performance of Polymeric Nano-Composites
Mary Boyce, Massachusetts Institute of Technology, Cambridge, MA

11 August (Thursday) continued

1215 Lunch

1330 Polymer Nanocomposite Research Efforts for Air Force and Propulsion Applications
Joseph Mabry, Air Force Research Laboratory, Edwards Air Force Base, CA

1400 Polymer/Carbon Nanotube Composite Film and Fibers
Satish Kumar, Georgia Institute of Technology, Atlanta GA

1430 Swnt Composite Fibers (Scf)
Wen-Fang Hwang, Rice University, Houston, TX

1500 Material Outgassing Study
John Prebola, Arnold Test Center, Arnold Air Force Base, TN

1530 Break

1545 Smart Structures
Sanders, AFRL/MLBC, Wright-Patterson AFB, OH

1615 Functionalization of Carbon Nanotubes via Electrophilic Substitution Reaction in Polyphosphoric Acid
Jong-Beom Baek, Chungbuk National University, Chungbuk, South Korea

1645 Hyperbranched Polymers as Toughening Processing Aids for Composite Matrices
Patrick Mather, Case Western Reserve University, Cleveland, OH

1715 Optomechanical Coatings for High-Power Mirrors and Adaptive Optics
Joseph Talghader, University of Minnesota, Minneapolis, MN

1745 end

12 August (Friday)

0750 Registration and Continental Breakfast

0800 Fiber reinforced Composites/Interest of MLBC
Fred Arnold, Air Force Research Laboratory, Wright-Patterson AFB, OH

0830 Structure-Property Relations of High Temperature Fluorinated Polyimides and their Composites
Roger J. Morgan, Texas A&M University, College Station, TX

0900 Nano-scale Control of Interfacial and Interphase Development in Polynanomatrix Composites
James Seferis, University of Washington, Seattle, WA

0930 Novel Continuous Carbon Nanofibers for the Next Generation Lightweight Structural Nanocomposites
Yuris Dzenis, University of Nebraska, Lincoln, NE

1000 Break

1015 Real-Time *In-situ* Characterization of Electron-Beam-Induced Bulk Polymerizations
Giuseppe Palmese, Drexel University, Philadelphia PA

1045 Durability Characterization of POSS-based Polyimides and Carbon-Fiber Composites for Air Force-Related Applications
Andre Lee, Michigan State University, East Lansing, MI

1115 Integrated Analysis Tools For Determination Of Structural Integrity and Durability Of High Temperature Polymer Matrix Composites
Gregory Dillon, Penn State University, College Station, PA

1145 Effects Of Physical Aging And Chemical Degradationon Mechanical Behavior of High-Temperature Polymer Matrix Composites
Marina Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH

1215 Lunch

1330 Composites for Munitions
Robert Sierakowski, Air Force Research Laboratory, Elgin AFB, FL

1400 Investigation and Optimization of High Performance Nanocomposites Produced with Nanotube Buckypaper Materials
Ben Wang, Florida State University, Tallahassee, FL

12 August (Friday) continued

1430 Nanomodified Carbon/Carbon Composites for Intermediate Temperatures
Joseph Koo, University of Texas at Austin, Austin, TX

1500 Intermediate Temperature Carbon/Carbon Structures
Harry Katz, Utility Development Corporation, NJ

1530 Break

1545 Multi-Functional Nano-Composite High-Temperature Resin Matrix Composites – Properties and Processing – An Update
Ranji Vaidyanathan, Advanced Ceramics Research, Inc, Tucson, AZ

1615 Nanocomposites for Carbon Fiber Reinforced Polymer Matrix Composites
Apoorva Shah, Triton Systems Inc, Chelmsford, MA

1645 Thermoset Resin Nanocomposites
Charles U. Pittman, Jr., Mississippi State University, Mississippi State, MS

1715 Advanced Polymer Composite Molding through Intelligent Process Analysis and Control

Robert Minaie, Wichita State University, Wichita, KS

1745 end

Keystone Workshop
21-26 August 2005
Agenda

Sunday, 21 Aug 05

5:00p – 7:00p No host reception, Keystone Lodge

Monday, 22 Aug 05

7:30 – 8:30	Continental Breakfast
8:30 – 9:00	Opening Remarks – Dr. Robert Mantz
Session 1	Robert Mantz, AFRL/MLBT, ***Multifunctional Aircraft Coatings***
9:00	Adam M. Rawlett, AMSRD-ARL-WM-MA, *Functional Polymer Surfaces via Self-Segregating Additives*
9:30	Wim van Ooij, University of Cincinnati, *A Multifunctional Primer/Coating System for Aluminum Alloys*
10:00	**BREAK**
10:15	S. R. Taylor, University of Mississippi Medical Center, *Increasing the Functionality of Military Coatings Using Nano-dimensioned Materials*
10:45	Gordon Bierwagen, North Dakota State University, *Mg-Rich Primers: Taking a Unique Concept and "Running With It"*
11:15	Amber Haines, UDRI, *Improved Passive Thermal Control Coatings*
11:45	Joe Osborne, Boeing Phantom Works, *Development of A Hybrid Corrosion Inhibitor and Its Use in an Enhanced Self-Priming Topcoat*
12:15	***Break for Afternoon***
Session 2	Dr. Joseph Osborne, Boeing Phantom Works, ***Specialty Coatings and Coating Design***
7:00	M. Rohwerder, Max-Planck-Institute for Iron Research, *Design of Inherently Delamination Resistant Polymer/Metal Interfaces*
7:30	Ras B. Pandey, University of Southern Mississippi, *Multi-component Film Growth by Computer Simulation Modeling*
8:00	**BREAK**
8:15	Linda Kasten, UDRI, *Surface Analysis of Organo-Silicate Coatings with Phosphonate Functionalities by XPS and ToF-SIMS*
8:45	Patrick Kinlen, Crosslink, *Applications of Light Emitting Devices of Variable Wavelength Emission*
9:15	ADJOURN

Tuesday, 23 Aug 05

7:30 – 8:30	Continental Breakfast
Session 3	Ken Qassim, AFRL/VSSV, and Pat Valentino, AFRL/MLBT, ***ESD Spacecraft Issues (CLOSED to non-US Citizens)***
8:30	Bill Biter, Sensortex, Inc., *Electrostatic Applique for Advanced Variable Emittance Control of Spacecraft Thermal Performance*
9:00	Gary Pippin, Boeing Company, *Status of the Materials International Space Station Experiments (MISSE)*
9:30	J. R. Dennison, Utah State University, *Measurements of Electrical and Electron Emission Properties of Highly Insulating Materials*
10:00	**BREAK**
10:15	Max Alexander, AFRL/MLBP, *Organic Based Space Durability EMI Shielding Materials*
10:45	Pawel Tlomak, AFRL/VSSV, *Space Plasma Experiment for Thin-Film Photovoltaics with Protective Coatings*
11:15	Suraj Rawal, Lockheed Martin Corporation, *Multifunctional Carbon Nanofiber Based Coatings for ESD Protection*
11:45	David M. Barnett, QFLEX, *Mitigating ESD in an MFS Way*
12:15	***Break for Afternoon***
6:30	***Banquet*** ***Roasted Goat Cheese Stuffed Pear Salad*** ***Brandied Mushroom Soup w/cream & chives*** ***Tenderloin of Beef & Spiced Rubbed Salmon w/jus lie & mango relish*** ***Kiwi Wild Berry Mille Feuille (puff pastry w/almond cream)*** ***PLEASE LET US KNOW IN ADVANCE IF YOU NEED A VEGETARIAN MEAL***

Wednesday, 24 Aug 05

7:30 – 8:30	Continental Breakfast
Session 4	Steve Szaruga, AFRL/MLBT, ***Military Applications of Coatings (CLOSED to non-U.S. Citizens)***
8:30	Lt Bolanle Akinlemibola, AFRL/MLBT, *Electrical and Thermal Characterization of Advanced Conductive Materials*
9:00	Lisa Farrier, AFRL/MLBT, *Analysis of Artificially Aged Military Coatings by X-Ray Photoelectron Spectroscopy*
9:30	Alan Fletcher, AFRL/MLSA, *UV-Curable Exterior Coatings*
10:00	**BREAK**
10:15	Diane Baker, ASC/YSAL, *Coatings Applications, Issues, and Opportunities for the B-2*
10:45	Shek Hong, Hontek, *High Performance Rain and Sand Erosion Resistant Sprayable Coatings and Molding Resins for Erosion Protection of Aircraft*
11:15	John DeAntoni, Boeing, *Paint on the Line*
11:45	Eric Morris, Deft Inc., *Advancements in Chrome-Free Technologies*
12:15	***Break for Afternoon***
7:00	***Poster and Panel Session***

Thursday, 25 Aug 05

7:30 – 8:30	Continental Breakfast
Session 5	Linda Kasten, UDRI, ***Surface Treatments and Multifunctional Coatings***
8:30	Alex Khramov, Universal Technology Corporation, *Sol-Gel Hybrids with Phosphonate Functionalities as Surface Treatment for Magnesium Materials*
9:00	Seva Balbyshev, Universal Technology Corporation, *Optimization of Processing Parameters of SNAP Coatings for Corrosion Protection of Al Alloys*
9:30	Rudy Buchheit, The Ohio State University, *Chemically Tailored Ion Exchange Compounds for Environmentally Friendly Inhibiting and Sensing Pigments for Corrosion Resistant Organic Coatings*
10:00	**BREAK**
10:15	Mohammad Khobaib, UDRI, *Detection and Location of Corrosion Underneath Coatings*
10:45	Martin Kendig, Rockwell Scientific Company, LLC, *Corrosion Inhibitors for "Smart" Corrosion Protective Coatings*
11:15	Carrie A. Delcomyn, Applied Research Associates, Inc., *Pressurization of Materials Coated with Multifunctional Strippable Polymers and the Vulnerability to Penetration of Toxic Chemical Agents*
11:45	Albert Schnieders, ION-TOF USA, Inc., *The Appliction of TOF-SIMS Analysis to the Development of New Multifunctional Materials*
12:15	***Break for Afternoon***
Session 6	Rajesh Naik, AFRL/MLPJE, ***Biologically-Inspired Coatings***
7:00	Ravi Kane, Rensselaer Polytechnic Institute, *The Design of Functional Nanostructured Materials*
7:30	Nikolai Lebedev, US Naval Research Laboratory, *Photoactive Protein-functionalized Surfaces*
8:00	**BREAK**
8:15	Ashutosh Chilkoti, Duke University, *Passive and Active Surfaces to Control Protein and Cell Interactions*
8:45	Jeff Brinker, Sandia National Laboratories, *Bio-Inspired Self-Assembly of Multifunctional Porous and Composite Nanostructures*
9:15	ADJOURN

Friday, 26 Aug 05

8:30 – 9:30 Continental Breakfast (We will start 1 hour later to allow attendees to check out of the hotel)

Session 7 Gordon Bierwagen, NDSU, ***Self-Assembled Monolayer and Layer-by Layer Thin Films***

9:30 Roger M. Leblanc, University of Miami, *Quantum Dots: Self-assembly and Layer-by-Layer Deposition Towards Sensor Development*

10:00 Don Haynie, Louisiana Tech University, *Designed Polypeptide Multilayer Nanofilms: Science and Technology*

10:30 BREAK

10:45 Nicholas Kotov, University of Michigan, *Multifunctional Composites Made by Layer-by-Layer Assembly*

11:15 Duhua Wang, NDSU, *Self-assembled Monolayer for Adhesion Improvement Between Polymer Coating and Aluminum Alloy Substrate*

11:45 Workshop Adjourn

(FINAL 11/25/2005)

CONFERENCE

Culture and Adversary Modeling

29 November -- 1 December, 2005

Hilton Palacio del Rio Hotel **210-222-1400**
200 South Alamo Street www.hilton.com/en/hi/hotels/index.jhtml?ctyhocn=SATPDHH
San Antonio TX 78205

Tuesday, 29 November

CULTURE AND ADVERSARY MODELING

8:00 Registration and Speaker Set-up (Salon del Rey, 4th Floor Mezzanine)

9:00 Welcome and Introduction
John Tangney, AFOSR

9:10 Social Simulation of the Pashtun Tribes along the Afghanistan - Pakistan Border
Ed MacKerrow, LANL

9:30 Computational Approaches to Understanding Belief Networks
Whitman Richards, MIT

9:50 Building Cultural Knowledge Fragments
Gene Santos, Dartmouth

10:10 BREAK

10:30 Laboratory for Computational Cultural Dynamics
Dana Nau, UMD

10:50 Social Influence Network Dynamics and Insurgent Movements
Michael Gabbay, ISL Inc.

11:10 Combining Game Theory and Social Network Analysis: an Empirical Example
Elisa Bienenstock, BAH

11:30 BREAK

11:50 Computational Model of Culture
Scott Page, University of Michigan

12:10 Interpretation of Live Data Capture from Cultural Perspective
Jore Park & Wylci Fables, Indasea

12:30 LUNCH — local restaurants

14:00 Mass Mobilization under Uncertainty of Information
Guillermo Owen, NPS

14:20 Control Theoretic Modeling for Uncertain Cultural Attitudes and Unknown Adversarial Intent
Jeff Shamma, UCLA

14:40 Computational Modeling of Cultural Dimensions in Adversary Organizations
Alex Levis, GMU

15:00 BREAK

15:20 Culture Modeling and Agents for World Diplomacy Games
Barry Silverman, University Pennsylvania

15:40 Algorithms for Collaborative and Adversarial Decision Making in Partially Observable Stochastic Games
Shlomo Zilberstein, University Massachusetts

16:00 Algorithmic Tools for Adversarial Games
Lee Krause, Securboration Inc

16:20 BREAK

16:40 A Dynamic Network Approach to Adversarial Modeling
Kathleen Carley, CMU

17:00 Graph Matching Technologies for Behavior Prediction
Tim Darr, 21st Century Tech Inc.

17:20 A Marriage Model of Cultural Interaction
Rick Warren, AFRL/HE

17:40 Cultural Understanding at the Tactical Level
Susan Numrich, IDA

18:30 **RECEPTION**
Institute of Texan Cultures, 801 S. Bowie Street
(Sponsored by the Institute for the Protection
of American Communities at the UTSA)

Wednesday, 30 November

7:00 Registration and Speaker Set-up

KEYNOTE ADDRESS

8:00 Mirrors and Windows: Media in the Middle East
John W. Rendon, The Rendon Group

PANEL DISCUSSION

8:40 Understanding Adversarial Decision Making from the Operational Viewpoint
LTG Thomas F. Metz, Commanding General III Corps

9:10 Assessing Adversarial Decision Making: An Intelligence Perspective
MG (ret) Glen Shaffer, dNovis Inc

9:40 Madrid: The Evolution of al Qaeda Operations
Marc Sageman, Univ Pennsylvania

10:10 BREAK

GOVERNMENT PROGRAMS

10:30 Systems for Multicultural Collaboration in Effects Based Operations
Linda Pierce, ARL

10:50 Pattern and Anomalies Detection (PAD) Process
Drew Carter, Army 1st IOC (Land)

11:15 Pre-Conflict Anticipation and Shaping (PCAS) Program
Robert Popp, DARPA

11:35 BREAK

11:55 Systems Dynamic Model of a Nation State
Capt J.D. Robbins, AFRL/IF

12:15 Adversarial and Threat Assessment -- New Methods to Integrate Computational and Social Sciences
D.J. Patil, DTRA

12:35 LUNCH — local restaurants

13:35 Culture and Adversarial Modeling
Eric Braedon and Keith Anthony, NASIC

13:55 Information Operations Innovative Network (IOIN)
Janet Fender, ACC

14:15 MCIA Cultural Initiatives
Emily Jackson, MCIA

14:35 BREAK

14:55 DMSO Programs in Cultural Modeling
Michael Young, AFRL/HE

15:15 Human Network Analysis at JWAC
Capt. Aaron Bell, JWAC

15:35 Joint Information Operations Center Overview
Rick Coronado, JIOC

15:55 BREAK

16:15 Formulation of Research on Adversarial Intent
Carol McCann, DRD (Canada)

16:35 Organizational and Cultural Criteria for Adversary Modeling (OCCAM)
Greg Zacharias, CRA

16:55 Modeling Culture
Rebecca Goolsby, ONR

17:15 **Open Sessions Adjourn**

Thursday, 1 December

GOVERNMENT PROGRAMS (cont)

Classified Session

8:00 Meet AF Bus Outside Palacio del Rio or
Find Own Transportation to

Kelly Field Club (210) 924-7341
250 Mabry (Bldg 1676)
San Antonio, TX 78226

9:00 Joint Integrative Analysis and Planning Capability
Maj (sel) Ken Stoni, JIOC

9:20 Geo-Spatial Contributions to Modeling
Paul Schaefer, NGIA

9:40 Operationalizing Cultural Awareness
Tom Schmidt, TRADOC

10:00 BREAK

10:20 Identifying Cultural Factors Influencing the Behavioral Responses to Non-Lethal Weapons
Lt Keith White, AFRL/HE

10:40 Factoring Culture into Influence Planning
Laurie Fenstermacher, AFRL/HE

11:00 DISCUSSION

11:30 Meet Transportation for Return to Hotel

12:00 Conference Adjourns

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
11/08/2004	Annual Report	1 Mar. 2003 – 29 Feb. 2004

4. TITLE AND SUBTITLE

Research Evaluation Management Services for The Chemistry and Life Sciences Program

5a. CONTRACT NUMBER
F49620-00-C-0009

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Judith M. Flory

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

8. PEFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Air Force Office of Scientific Research
Directorate of Chemistry and Life Science
Arlington, VA 22203-1954

10. SPONSOR/MONITOR'S ACRONYM(S)
AFRL/AFOSR

11. SPONSORING/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

During the performance of this contract UES, Inc. provided research evaluation services for the Chemistry & Life Sciences Directorate, Air Force Office of Scientific Research in areas that include Neurosciences, Computer Sciences, Otolaryngology, Meteorology, Chemistry, Biotechnology and Fuels and in related programs under development. Evaluations were secured for 68 research proposals. Three program reviews were held in the areas of Molecular Dynamics & Theoretical Chemistry, BioInspired Concepts (BIC) Theme and Biomimetic and Biomaterial & Biointerfacial Sciences. Three workshops were held in the areas of Culture & Personality in Models of Adversarial Decision-Making, Cell-Like Entities (CLE), and Dip-Pen Nanolithography (DPN). One panel meeting was held in Molecular Dynamics & Theoretical Chemistry.

15. SUBJECT TERMS

Neurosciences, Molecular, Dynamics, Perception, Cognition, Chronobiology, DipPen, Nanolithography Biomimetic, Biomaterial, Biointerfacial

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	Unclassified	Unclassified		37	19b. TELEPHONE NUMBER (Include area code) (937)426-6900

ANNUAL REPORT

CHEMISTRY AND LIFE SCIENCES RESEARCH PROGRAM

CONTRACT NO. F49620-00-C-0009

Period of Performance: 3/1/03 – 2/29/04

Prepared For:

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

CHEMISTRY AND LIFE SCIENCES DIRECTORATE

Dr. Genevieve Haddad, Program Manager

Presented By:

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

Table of Contents

INTRODUCTION

UES, Inc. is providing research evaluation services to the Directorate of Chemistry and Life Sciences, Air Force Office of Scientific Research (AFOSR), in sub areas that include Neurosciences (e.g., Neurochemistry, Biology, Electrophysiology, Neuroanatomy, Multisensory Integration/Spatial Orientation, Cardiovascular Physiology, and Bioenvironmental Hazards; Psychophysics, Psychophysiology, Physiological Psychology, Sensation, Perception, Cognition); Computer Sciences (e.g., Vision and Robotics); Otolaryngology; Meteorology, Chemistry (e.g., computational chemistry, polymeric and organic materials, photonic materials, inorganic and surface chemistry, high density materials); Biotechnology (e.g., materials and processes); and Fuels (e.g., petroleum and synthetic); and in related programs under development.

The services provided by UES, Inc. include: selecting qualified scientists to evaluate proposals, assembling scientific groups to evaluate, analyze and advise on content and direction of Chemistry and Life Sciences Programs; organizing workshops to assist in the definition of new basic research areas proposed by the Chemistry and Life Sciences Directorate; providing advisors to make presentations and assist government personnel with analyzing areas of relevant science; and providing advisors to assist and advise on site visits to research laboratories.

The fourth option year included: 76 Proposals Reviewed, 3 Program/Contractor Reviews, 1 Workshop and 1 Panel Meeting.

A. Evaluations of Individual Research Proposals

UES mailed 76 proposals to evaluators during the performance period of 1 March 2003 through 29 February 2004.

UES has been providing the Director of Chemistry and Life Sciences a Summary of Proposals Under Review (SPUR) report on a biweekly basis. This report is now being sent electronically as well as a hard copy. This report is composed of the UES log sheet indicating the proposals sent out, the names of the evaluators to whom the proposals were sent, the dates the proposals were mailed, the tickle date, any necessary comments, and the date the reviews were received. This allows the Program Managers to have a current listing of all proposal activity.

B. Contractor/Program Reviews

1. The first program review was **Molecular Dynamics and Theoretical Chemistry Program Review**, Shelter Pointe, CA, 18-20 May 2003 The objectives of the molecular dynamics program are to understand, predict, and control the reactivity and flow of energy in molecules. Twenty-five scientists gave presentations regarding their grant proposals in this area. UES provided on-site support, abstract booklets and made all arrangements for the meeting. ($1,885.92),

   Dr. Michael Berman, Program Manager
   Total Attendance: 94
   Speakers: 27
   Posters: 42

2. The second program review was **BioInspired Concepts (BIC) Theme Review**, Lowes Annapolis Hotel, Annapolis, MD, 1-2 June 2003, ($6,256.98)
Dr. Walter Kozumbo, Program Manager.

Total Attendance:	26
Speakers:	22
Attendees:	4

3. The third program review was **Biomimetic, Biomaterial & Biointerfacial Sciences**, Hawk's Cay Resort, Hawk's Cay, FL, 19-23 January 2004. UES provided on-site support, abstract booklets and made all arrangements for the meeting. (-$2,169.84)
Dr. Hugh De Long, Program Manager.

Total Attendance:	34
Speakers:	29
Attendees:	5

C. **Workshops**

1. AFOSR Culture and Personality in Models of Adversarial Decision Making
Hilton McLean Tysons Corner, McLean, VA, 13-14 November 2003, ($5,121.87)
Dr. John Tangney, Program Manager

Total Attendance:	71
Speakers:	31
Attendees:	40

2. **AFOSR Cell-Like Entities (CLE)**, Holiday Inn I-675, Fairborn, OH, 17-18 June 2003 ($890.33)
Walter Kozumbo, Program Manager.

Total Attendance:	44
Speakers:	11
Attendees:	33

3. **AFOSR Dip-Pen Nanolithography (DPN) Workshop**, Hawk's Cay Resort, Duck Key, FL, 26-27 January 2004, The goal of this workshop was to bring together scientists and engineers with broad backgrounds to explore the state-of-the-art and future capabilities of DPN. DPN is now in over 50 different laboratories around the world and has become a very powerful scientific discovery tool. It also looks quite promising as a flexible production tool for certain applications in the life sciences industries. ($1,136.45)
Hugh C. De Long, Program Manager.

Total Attendance:	42
Speakers	24
Attendees	18

D. **Panel Meeting**

Molecular Dynamics & Theoretical Chemistry Panel Meeting, Marriott Hotel,
Dulles, VA, 20 June 2003 ($926.04)
Dr. Michael Berman, Program Manager
Number of Panel Members Present: 7

F. **Advisors**

In addition to advisors provided for Program Reviews, Workshops and Panel Meetings, UES provided travel, per diem and in many cases, honorarium for the following advisors:

Plamen Atanassov, **2004 Nano-Materials for Defense Applications Symposium, Maui, Hawaii**
23-26 February 2004
($2,157.35 Reimbursement for Expenses)
Paul Trulove, Program Manager

Scott Atran, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop,** McLean, VA
13-14 November 2003
($1,548.54 Reimbursement for Expenses)
John Tangney, Program Manager

Kit Bowen, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting,** Dulles, VA
20 June 2003
($340.00 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Jillian Buriak, **AFOSR DPN Workshop**, Duck Key, FL
26-27 January 2004
($1,229.79 Reimbursement for Expenses)
Dr. Hugh De Long, Program Manager

Kathleen Carley, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,552.75 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Sun-Ki Chai, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,181.08 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Peter Carnevale, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,968.60 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Advisors - continued

Francis J. Doyle III, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $1,442.75 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

David Funder, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,210.50 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

William C. Fuqua, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $400.39 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Bruce Garrett, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**,
Dulles, VA, 20 June 2003
($802.00 Honorarium, $645.00 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Joseph Henrich, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA, 13-14 November 2003
($803.84 Honorarium, $726.50 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Wilson Ho, **AFOSR Molecular Dynamics Contractor's Review**, San Diego, CA
18-20 May 2003
($459.80 Reimbursement for Expenses)
Dr. Michael Berman, Program Manger

John R. Hollenbeck, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA, 13-14 November 2003
($952.51 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Mark Johnson, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**,
Dulles, VA, 20 June 2003
($458.03 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Advisors - continued

Helen Altman Klein, **AFOSR Culture & Personality in Models of Adversarial Decision-Making** Workshop, McLean, VA
13-14 November 2003
($734.50 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Craig Knoblock, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,629.44 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

James R. Lackner, **US Air Force Academy**, Colorado Springs, CO
18-20 May 2003
($580.00 Reimbursement for Expenses)
Dr. Willard Larkin, Program Manager

James M. Lisy, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**, Dulles, VA, 20 June 2003
($802.00 Honorarium, $773.42 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Gerald Matthews, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA, 13-14 November 2003
($297.00 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Harley McAdams, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $1,023.36 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Douglas Medin, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($878.97 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Phillip Messersmith, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $528.45 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Advisors - continued

John W. Mintmire, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**, Dulles, VA, 20 June 2003
($773.42 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Carlo Montemagno, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $2,310.49 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Ara Norenzayan, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop,** McLean, VA
13-14 November 2003
($1,362.14 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Scott Page, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($896.25 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Krishna Pattipati, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($767.29 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Avrom Pfeffer, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($1,033.01 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Steen Rasmussan, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
(Invoice never received)
Dr. Walter Kozumbo, Program Manager

Terence Risby, **JP-8 Jet Fuel Toxicology Meeting**, Tucson, AZ
14-16 May 2003
($1,127.49 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Advisors - continued

James Schneider, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $541.28 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Uwe Sleytr, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $541.28 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Lazar Stankov, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA, 13-14 November 2003
($731.50 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Josh Tenenbaum, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA, 13-14 November 2003
($746.25 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

L. Scott Theibert, **AFOSR Phase I STTR "High Strength C-C Composites**
Dayton, OH, 3 June 2003
($401.00 Honorarium)
Dr. Charles Lee, Program Manger

Fritz Vollrath, **Silk Conference**, Montreal, Canada
Week of June 24, 2003
($600.00 Reimbursement for Expenses)
Dr. Hugh De Long, Program Manager

Albert F. Wagner, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**,
Dulles, VA, 20 June 2003
($560.25 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Lei Wang, **AFOSR Cell-Like Entity Workshop**, Fairborn, OH
27-28 June 2003
($803.84 Honorarium, $1,247.00 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

Robert L. Whetten, **AFOSR Molecular Dynamics/Theoretical Chemistry Panel Meeting**,
Dulles, VA, 20 June 2003
($775.25 Reimbursement for Expenses)
Dr. Michael Berman, Program Manager

Advisors – continued

Patrick Winston, **AFOSR Culture & Personality in Models of Adversarial Decision-Making Workshop**, McLean, VA
13-14 November 2003
($581.50 Reimbursement for Expenses)
Dr. John Tangney, Program Manager

Yuhong Yang, **Silk Conference**, Montreal, Canada
Week of 24 June 2003
($600.00 Reimbursement for Expenses)
Dr. Hugh De Long, Program Manager

Liu Yi, **Silk Conference**, Montreal, Canada,
Week of 24 June 2003
($600.00 Reimbursement for Expenses)
Dr. Hugh De Long, Program Manager

Errol Zeiger, **JP-8 Jet Fuel Toxicology Meeting**, Tucson, AZ
13-16 May 2003
($1,114.81 Reimbursement for Expenses)
Dr. Walter Kozumbo, Program Manager

SUMMARY

UES is pleased to continue to perform the specific tasks assigned to them in accordance with provisions of the contract. Participants will continue to be Dr. Mike Livingston as Program Manager, Judith M. Flory, Program Administrative Manager and Amiee Nichols as Program Assistant. UES personnel appreciate the opportunity to be of service to AFOSR in this interesting and worthwhile program.

LIST OF APPENDICES

BREAKDOWN OF RESEARCH PROPOSALS BY PROGRAM MANAGER

PROGRAM MANAGER	NO. OF PROPOSALS
Berman	22
De Long	7
Kozumbo	7
Larkin	9
Lee	11
Sorkin	12
Tangney	0
Trulove	8

2003 Molecular Dynamics & Theoretical Chemistry Contractors Review

Shelter Pointe Hotel
San Diego, CA

Sunday, 18 May 2003 (Point Loma 1)

1:00 PM **Registration opens**

2:45 PM **Opening remarks**

3:00 **Ultrafast Dynamics with Diffraction and Mass Spectrometry**
A. H. Zewail, California Institute of Technology Pasadena, CA

3:30 **Free Radical Spectroscopy in Helium Nanodroplets**
R. E. Miller, University of North Carolina, Chapel Hill, NC

4:00 **High Resolution Pulsed Infrared Cavity Ringdown Spectroscopy of Ions and Clusters**
R. J. Saykally, University of California, Berkeley, CA

4:30 **Break**

5:00 **Charge Transfer Reactions of O_2^+ with Alkylbenzenes at High Pressure: Stabilization of the Excited Intermediate and Determination of the Step Sizes for Collisional Energy Transfer**
A. A. Viggiano, Air Force Research Laboratory, Hanscom AFB, MA

5:30 **Bonding and Non-bonding Interactions Involving Aluminum and Hydrogen**
P. J. Dagdigian, The Johns Hopkins University, Baltimore, MD

6:00 **Nuclear Quantum Effects in Hydrogen Transfer Reactions: Polyhedral Oligomeric Silsesquioxanes and Ionic Liquids**
S. Hammes-Schiffer, Pennsylvania State University, University Park, PA

7:00 PM **Poster Session and Reception (Point Loma 2)**

Monday, 19 May 2003 (Point Loma 1)

7:45 AM **Continental Breakfast/ Registration Desk open**

8:30 **Multidimensional Surface-Enhanced Sensing and Spectroscopy**
R. P. Van Duyne, Northwestern R University, Evanston,IL

9:00 **Plasmonics: Manipulation of Electromagnetic Fields at the Nanoscale**
N. J. Halas, Rice University, Houston, TX

9:30 **Polymer Nanocomposites: Issues and Opportunities**
R. A. Vaia, Air Force Research Laboratory, Wright-Patterson AFB, OH

10:00 **Break**

10:30 **Conformations of Macromolecular Systems: POSS, PPV's and Paracyclophanes**

*M. T. Bowers, University of California, Santa Barbara, CA*11:00

11:00 **Hyperthermal Reactions of $O(^3P)$ with H_2 and Saturate Hydrocarbons**
T. K. Minton, Montana State University, Bozeman, MT

11:30 **Hyperthermal O-Atom-Alkene Collision Products - Recent Results**
J. A. Dodd, Air Force Research Laboratory, Hanscom AFB, MA

12:00 PM **Lunch (Point Loma 2)**

1:30 **Free time for round table and informal discussions**

Possible topics:

- *Manipulating Atoms: Where Can it Lead?*
- *Potential Contributions from Chemical Physics to Biology*
- *Chemistry with High-Intensity and Tailored Laser Fields*
- *Molecular Design by Genetic Algorithms*

An Evening of Ionic Liquids

7:00 PM **Field Evaporation of Ionic Liquids for Space Propulsion Purposes**
R. A. Dressler, Air Force Research Laboratory, Hanscom AFB, MA

7:20 **Structural Effects on the Physical Properties of Ionic Liquids**
G. W. Drake, Air Force Research Laboratory, Edwards AFB, CA

7:40 **The Multi-Scale Simulation of Ionic Liquids**
G. A. Voth, University of Utah, Salt Lake City, UT

8:20 **Discussion**

Tuesday, 20 May 2003 (Point Loma 1)

7:45 AM	**Continental Breakfast**
8:30	**Structural, Electronic, and Impurity-Doping Effects in Nanoscale Chemistry: Supported and Free Gold Nanoclusters** *U. Landman, Georgia Institute of Technology, Atlanta, GA*
9:00	**Phase Transitions in Inorganic Nanorods** *A. P. Alivisatos, University of California, Berkeley, Berkeley, CA*
9:30	**New Tools for the Study of Combustion Chemistry and Chemisorption on Nanoscale Supported Metals** *A. M. Rappe, University of Pennsylvania, Philadelphia, PA*
10:00	**Break**
10:30	**Model Catalysts Prepared by Size- and Energy-Selected Ir Nanocluster Deposition** *S. L. Anderson, University of Utah, Salt Lake City, UT*
11:00	**A Theoretical Study of the Mechanism of Propene Epoxidation on Au/TiO_2** *H. Metiu, University of California, Santa Barbara, CA*
11:30	**Manipulation of Chemical Interactions with the STM** *W. Ho, University of California, Irvine, Irvine, CA*
12:00 PM	**Lunch (AJ's Lounge)**
1:15	**Polynitrogen Chemistry** *K. O. Christe, Air Force Research Laboratory, Edwards AFB, CA*
1:45	**New High Energy Density Materials from High Pressure** *R. J. Hemley, Carnegie Institution of Washington, Washington, DC*
2:15	**Evidence for Photolytic Production of Cyclic-N_3** *A. M. Wodtke, University of California, Santa Barbara, CA*
2:45	**Break**

Tuesday, 20 May 2003-Continued

3:15 **Program Status**
M. R. Berman, Air Force Office of Scientific Research, Arlington, VA

3:30 **Azolide Anion Chemistry and Energetics**
W. C. Lineberger, University of Colorado, Boulder, CO

4:00 **Light Emission from Hot and Compressed Matter: Simulations and Characterization of the Thermal-like Collision-Induced Emission Spectrum Using Sum Rules**

R. D. Levine, Hebrew University, Jerusalem, Israel

4:30 **Ultrafast Heterodyne Detected Infrared Multidimensional Vibrational Echo: Hydrogen Bond Dynamics and Beyond.**

M. D. Fayer, Stanford, CA

5:30 **Dinner Buffet (Cabo Garden)**

AFOSR BioInspired Concepts (BIC) Review
The Loews Annapolis Hotel
1-3 June 2003

1 June (Sunday)

1800-1930 Informal Social Mixer at Loews (Thomas Point)

2 June (Monday) Windmill Point

0730 Continental Breakfast (Windmill Point Foyer)

800-830 Introduction
Walt Kozumbo & Paul Trulove, AFOSR

830-900 Nanobiohybrids: New Model Systems for Bio-Membranes and Sensors
Emmanuel Giannelis, Cornell University (Trulove)*

900-930 Supramolecular Engineering of New Lithium Ion Conducting Polymer Electrolytes
John Arnold, University of California, Berkeley (Trulove)

930-1000 Coffee Break

1000-1030 Development of Artificial Hair Cells – Polymer and Multi-Modal Sensing
Chang Liu (PI) and Fred Delcomyn, University of Illinois (Trulove)

1030-1100 Bio-Inspired Integration Efforts with AFRL/MLP in Thermal Sensors
Morley Stone, Air Force Research Lab, WPAFB, OH (De Long)

1100-1130 Protein-Based Thermal Sensors From Snakes and Mammals
Todd Pappas (PI), J. Garcia, B. Christensen and M. Motamedi, University of Texas, Galveston (De Long)

1130-1300 Lunch (on your own)

1300-1330 Chemically Tailored 3-D Nanoparticle Structures by the BaSIC Process
F. Zalar, R. Unocic, C. Gaddis, J. Zhao, P. Sarosi and Ken Sandhage (PI), OSU; R. Naik, G. Agarwal and M. Stone, Air Force Research Lab, WPAFB (De Long)

1330-1400 Engineering of Thermally and Mechanically Activated Nanosensors
Paul Blount, University of Texas, SW Medical Center, Dallas (De Long)

1400-1430 Bio-Inspired Organic/Inorganic Hybrid Electronic and Photonic Materials and Structures

Alex K-Y Jen (PI) and Mehmet Sarikaya, University of Washington (Lee)

1430-1500 **Coffee Break**

1500-1530 BioHarvesting: Use of Natural Forms for Photonics
Richard Vaia (PI) and B. Farmer, Air Force Research Lab, WPAFB
Edwin Thomas, MIT (Lee)

1530-1600 DNA-Assisted Photonic Crystal Fabrication
Fotios Papadimitrakopoulos, University of Connecticut (Lee)

1600 **Meeting adjourns for the day (dinner on your own)**

3 June (Tuesday) Windmill Point

0730 Continental Breakfast (Windmill Point Foyer)

800-830 Nanosecond, Megawatt, Millijoule Pulses Selectively Perturb But Do Not Porate Mammalian Cells,
P. Vernier, L. Marcu, C. Craft and Martin Gunderson (PI)
University of Southern California (Barker)

830-900 Experimental and Modeling Studies of Cell Response to Ultrashort, High-Intensity Electric Fields – Implications for Intracellular Manipulation
Ravindra Joshi (PI), K. Schoenbach and S. Beebe,
Old Dominion University (Barker)

900-930 Cell Fates as Attractors in Genomic Regulatory Networks,
Sui Huang, Harvard (Kozumbo)

930-1000 **Coffee Break**

1000-1030 Simulating the Interactions of Genes, Proteins and Metabolites in Cell-Like Entities
Brent Foy, Wright State University (Kozumbo)

1030-1100 New Platform of Molecular Reagents for Altering the Proteome
Harold Smith, University of Rochester (Kozumbo)

1100-1130 The Complexity and Robustness of Biological Networks,
John Doyle, Caltech (King)

1130-1300 **Lunch (on your own)**

1300-1330 Three Dimensional Flapping Flight,
Z. Jane Wang, Cornell University (King)

1330-1400 Sensing, Stimulation and Signal Transduction (Retinal Processing in Polarization Vision in Teleosts Fishes)

Craig Hawryshyn (PI) and J. Plant, University of Victoria (Larkin)

1400-1430 **Coffee Break**

1430-1500 Bio-Inspired Techniques for Representation of Polarization Information and Enhancement of Target Detection in Polarization-Based Imaging and Vision,
Nader Engheta (PI) and E. Pugh, University of Pennsylvania (Larkin)

1500-1530 Novel Optical Materials from Marine DNA for Optical Memory and Light Amplification Systems,
Naoya Ogata, Chitose Institute of Science and Technology, Japan (Lee)

1530-1600 Wrap-up Discussion

1600 End of Meeting

* Names in Parentheses are those of AFOSR program managers of task

2004 AFOSR Biomimetic, Biomaterial and Biointerfacial Sciences Program Review

Hawk's Cay Resort
Duck Key, FL

19-23 January 2004

Sunday, 18 January 2004 Registration and Reception, 5:00 to 7:00 PM

Monday, 19 January 2004

0830 Opening Remarks – Hugh De Long
Air Force Office of Scientific Research, AFOSR/NL

Directed/Self Assembly

0845 Self-Assembling Biological Structures with Engineered Functionalities
Rajesh R. Naik, Air Force Research Laboratory, MLPJE

0925 Self-Assembly of Bio-Inspired Nanostructures
C. Jeffrey Brinker, University of New Mexico

1005 Break

1035 *Design and Development of Nanoscale Biomotor Power Units*
Richard C. Holz, Utah State University

1115 *Surface Templated, Bio-Inspired Synthesis and Fabrication of Functional Materials*
Chad Mirkin, Northwestern University

1215 **Lunch**

1930 *Ultra-Sensitive and Selective Chip-Based Detection of DNA*
Chad Mirkin, Northwestern University

2030 *Front-End Processing of Cell Lysates for Enhanced Chip-Based Detection and Analysis*
James W. Schneider, Carnegie Mellon University

Tuesday, 20 January 2004

0830 *Biomimetic Lubrication Schemes: Molecular-level Studies*
Scott Perry, University of Houston

0910 *Biological and Biomimetic Lubrication Schemes: Molecular-level and Macro-level Studies*
Nicholas D. Spencer, Swiss Federal Institute of Technology

0950 **Break**

1020 *DNA-DNA and DNA-surface Interactions Measured Using Homo-oligonucleotides*
Lloyd J. Whitman, Naval Research Laboratory

100 *Title*
Angela Belcher, MIT

1140 **Combinatorial Analysis of Functional Interfaces and Surfaces Generated Via Dip-Pen Nanolithography**
Thomas B. Higgins, Harold Washington College

1220 **Lunch**

1930 *S-layer Templated Nanoparticle and Carbon Nanotube Arrays*
Dietmar Pum, Universitat fur Bodenkultur

2010 *Nanocomposite Compliant Nanomembranes for Thermal Sensing*
Vladimir V. Tsukruk, Iowa State University

Wednesday, 21 January 2004

0830 Direct Nanoscale Conversion of Bio-Molecular Signals into Electronic Information
Jimmy Xu, Brown University

Silk

0930 Processing and Structural Analysis of Silk Films
Rajesh R. Naik and David M. Phillips, Air Force Research Laboratory, MLPJE

1005 **Break**
1035 Processing and Structural Analysis of Silk Films
Robert A. Mantz and Lawrence F. Drummy, Air Force Research Laboratory, MLPJE

1115 Biomimetic Microstructure Formation of High Performance Silk Films and Fibers
Margaret E. Roylance, Foster-Miller, Inc.

1215 **Lunch**

1930 **Silk Protein Assembly and Function – A Model for Polymer Design**
David Kaplan, Tufts University

2010 Silken Webs: The Secret of the Spider's Success?
Fritz Vollrath, Oxford University

Thursday, 22 January 2004

0830 Spider Silk as a Biomaterial
Randolph Lewis, University of Wyoming

0910 Optical Limiting Silk Membranes and Coatings
Ronald K. Eby, The University of Akron

0950 Break

1020 Nanomechanics of Biopolymers
Kathryn J. Wahl, Naval Research Laboratory

Biominerialization

1100 Biological Templates for Inorganic Synthesis and Its Applications
Rajesh Naik, Air Force Research Laboratory, MLPJE

1140 Lunch

1320 Studies of Biosilicification: The Role of Proteins, Carbohydrates and Model Compounds in Structure Control
Carole C. Perry, The Nottingham Trent University

1400 Chemically-Tailored 3-D Nanoparticle Structures by the BaSIC Process
Kenneth H. Sandhage, Georgia Institute of Technology

1440 Break

Friday, 23 January 2004

Thermal Sensors

0830 The Role of Differential Near-Infrared Light Scattering of Mammalian Cells in their Differentiation and Social Behavior
Guenter Albrecht-Buehler, Northwestern University

0910 Toward the Engineering of a Mechanically Activated Nanosensor
Paul Blount, University of Texas

0950 Break

1020 Infrared Sensory Systems in Pyrophilous Beetles
Helmut Schmitz, Bonn University

Chromophores

1100 Biological Chromophores for Potential DoD Applications

Morley O. Stone, Air Force Research Laboratory, MLPJE

AFOSR WORKSHOP

Culture and Personality in Models of Adversarial Decision-Making

13-14 November 2003

Hilton McLean Tysons Corner
7920 Jones Branch Drive
McLean VA 22102

703-761-5200
www.mclean.hilton.com

13-Nov-03 Thursday

7:30 Continental Breakfast (Outside the Amphitheater on Lower Level)

7:45 Registration and Speaker Set-Up (Amphitheater on Lower Level)

8:15 **Introduction**
John Tangney, AFOSR

GOVERNMENT PROGRAMS

8:25 **NASIC's Behavioral Influences Analysis Concept**
Greg Jannarone or Eric Braeden, NASIC

8:55 **DMSO Programs on Cultural Effects**
Michael Young, AFRL/HE

9:15 **DARPA Program: Wargaming the Asymmetric Environment**
Ruth Willis, NRL

9:35 **NSF Programs in Decision, Risk, and Management Sciences**
Jonathan W. Leland, NSF

9:55 BREAK

10:15 **Social Network Analysis of Terror Networks: Perspectives from the ONR Research Program**
Rebecca Goolsby, ONR

10:35 **Affordability in Behavior Modeling**
Ruth Willis, NRL

10:55 **AFRL/IF Initiatives in Adversarial Decision Modeling**
Paul Bello, AFRL/IF

11:15 **Cognitive Engineering for Adaptable Leaders and Teams**
Linda Pierce, ARL

CULTURAL RESEARCH

11:35 **AFRL/HE Research on Culture**
Timothy Gameros and Gilbert Kuperman, AFRL/HE

11:55 NO-HOST LUNCH AT HOTEL RESTAURANT

13:00 **Culture and Resource Conflict**
Doug Medin, Northwestern University

13:20 **Decision Making in Cultural Contexts**
Scott Atran, University of Michigan

13:40 **Crossing Cognitive Borders: Working with Differences**
Helen Altman Klein, Wright State University

14:00 BREAK

14:20 **Cross-Cultural Variations in Economic Decision-Making**
Joe Henrich, Emory University

14:40 **Culture and Conflict**
Peter Carnevale, NYU

15:00 **Psychometric Approaches to Identifying Cultural Differences**
Patrick Kyllonen and Lazar Stankov, Educational Testing Service

15:20 **Culture and Reasoning**
Ara Norenzayan, Univ British Columbia

15:40 BREAK

16:00 **Modeling Covert Networks**
Kathleen Carley, CMU

PERSONALITY RESEARCH

16:20 **Personality Traits and Decision-Making: Making the Most of Limited Diagnosticity**
Gerry Matthews, University of Cincinnati

16:40 **The Role of Personality in Cooperative and Adversarial Group Contexts**
John Hollenbeck, Michigan State

17:00 **Basic Processes in Judging Personality Accurately**
David Funder, University of California, Riverside

17:20 DAY ADJOURNS (No-host dinner at local restaurants)

14-Nov-03 Friday

7:15 Continental Breakfast (Outside the Amphitheater on Lower Level)

MODELING

8:00 **Effects Based Operations and Cultural Modeling: A Needed Synthesis**
Alex Levis, Air Force

8:20 **Culturally Sensitive Modeling for Intelligent-Agent-Based Decision Support**
Alexander D. Stoyen, 21st Century Systems Inc; Sun-Ki Chai, Univ Hawaii at Manoa

8:40 **Anticipating a Leader's Decision**
Dennis Buede, Innovative Decisions Inc; Richard Rees, CIA; Paul Sticha, HumRRO

9:00 BREAK

9:15 **Extracting Data from Online Sources**
Craig Knoblock, USC

9:35 **Representationally Complete Language Systems: Benefits and Obstacles**
Patrick Winston, MIT

9:55 **Agent-Based Models of Culture**
Scott E. Page, University of Michigan

10:15 **Analytic Modeling of Adversaries**
Thomas Murray, SAI

10:35 BREAK

10:50 **Agent-Based Modeling of Recruiting**
Wendell Jones, Sandia

11:10 **Organizational Strategies and Structures: Taking into Account the Adversary**
Krishna Pattipati, University of Connecticut

11:30 **Modeling Agents' Beliefs and Decision-Making Processes in Games**
Avi Pfeffer, Harvard University

11:50 **Putting Domain-Specific Knowledge into Domain-General Rational Models of Human Inference**
Josh Tenenbaum, MIT

12:10 NO-HOST LUNCH AT HOTEL RESTAURANT

DISCUSSION

13:15 What Future **Capabilities** Are Envisioned?

13:35 What Future **Technologies** Might Enable These Capabilities?

13:55 What New **Knowledge** Might Foster Desired Technology Developments?

14:15 How Do Existing Research **Programs** Tile the Space of Desired Knowledge?

14:35 Are Programmatic **Gaps** Evident?

14:55 Are Identified Gaps **Significant** for Capabilities Envisioned?

15:15 MEETING ADJOURNS

AGENDA

TUESDAY, 17 June 2003

0800-0810	**Welcome** Dr. John Frazier-AFRL
0810-0855	**Keynote Speaker** *Systems Architecture of the Bacterial Cell Cycle Control System* Dr. Harley McAdams Professor, Developmental Biology Department, Stanford Univ. School of Medicine
0900-0910	**Break**
0910-0950	*Modeling and Analysis Issues in Biophysical Networks* Dr. Frank Doyle-UCSB
0950-1030	*2D-Protein Arrays (S-layers) as Patterning Element in Bionanotechnology and Biomimetics* Dr. Uwe Sleytr-Professor at U. fur Bodenkultur, Austria
1030-1040	**Break – Welcome** Dr. Ruck
1040-1120	*The Genesis of Engineered Intelligent systems from the Machinery of Life* Dr. C. Montamagno-UCLA
1120-1200	*Genetically Encoding Novel Amino Acids in Cells* Dr. Lei Wang, Research Associate, Department of Pharmacology, University of California, San Diego
1200-1330	**Lunch**
1330-1410	*Assembling Protocells: Rational and Evolutionary Design* Dr. Steen Rasmussan, Self-Organizing Systems, Team Leader (Acting), PhD Physics, Los Alamos National Laboratory
1410-1450	*Peptide-Amphiphiles as Biomimetic Materials* Dr. J. Schneider—Carnegie Mellon University, Assistant Professor, Department of Chemical Engineering
1450-1500	**Break**
1500-1540	Dr. Fuqua, Assistant Professor, Dept. of Biology—Indiana University
1540-1620	*Biological Strategies for Control of the Inorganic-Organic Interface:Preventing/Encouraging Cell Adhesion* Dr. Messersmith Professor, Biomedical Engineering Department Northwestern University
1620-1630	**Wrap Up**

WEDNESDAY, 18 June 2003

0800-0900	**Cell-Like Entity** Dr. Frazier
0900-1200	**Brainstorming Session**
1200-1300	**Lunch**
1300-1630	**Strategy Business Meeting** AFRL Members

2004 AFOSR Dip-Pen Nanolithography Workshop
Hawk's Cay Resort
Duck Key, FL
January 26-27, 2004

Monday, January 26, 2004

0800 - 0830 Registration/Continental Breakfast

0830 - 0930 **Plenary Talk - Dip-Pen Nanolithography: State-of-the-Art Applications and Future Challenges**
Chad A. Mirkin, Northwestern University, Evanston, IL

0930 - 1000 **Fabrication and Modification of Nanostructures Using Dip-Pen Nanolithography**
Jie Liu, Duke University, Durham, NC

1000 - 1030 **Massively Parallel and High Density DPN Probes**
Chang Liu, Microelectronics Laboratory, University of Illinois, Urbana, IL

1030 - 1045 Break

1045 - 1115 **Teaching "Old" Materials "New" Tricks: Site-Specific Nanopatterning of Functional Inorganics**
Vinayak P. Dravid, Northwestern University, Evanston, IL

1115 - 1145 **Semiconductor Surfaces with Nanometer Features Composed of TAT Peptides**
Albena Ivanisevic, Purdue University, West Lafayette, IN

1145 - 1215 **Enzyme Kinetics Measured from Nanoscale Arrays of Horseradish Peroxidase Formed by Dip-Pen Nanolithography**
Patrick C. Collier, California Institute of Technology, Pasadena, CA

1215 - 1330 Lunch Break

1330 - 1400 **Theoretical Studies of Dip Pen Nanolithography**
George Schatz, Northwestern University, Evanston, IL

1400 - 1430 **Heated Atomic Force Microscope Cantilevers for Temperature-Activated DPN**
William King, Georgia Institute of Technology, Atlanta, GA

1430 - 1500 **Fabrication of "Smart" Biomolecular Nanostructures using Dip-Pen Nanolithography**
Stefan Zauscher, Duke University, Durham, NC

1500 - 1530 **Design and Development of Nanoscale Biomotor Power Units**
Richard C. Holz, Utah State, Logan, UT

1530 - 2000 Afternoon Break

2000 - 2150 **Poster Session/Mixer**

Study of Electrical Characteristics of Au Nano-Wires Drawn by Dip Pen Nanolithography
Loveleen Brar, Indian Institute of Science, Bangalore, AK

Massively Parallel and High Density DPN Probes
David Bullen, University of Illinois/Urbana-Champaign, Urbana, IL

Nanoscale Precision Coating for Nanomechanical Sensors by Dip-Pen Technique
Ida Lee, University of Tennessee, Oak Ridge, TN

Nano-Immunoassays for Ultrahigh Sensitive/Selective Detection of HIV
Ki-Bum Lee, Northwestern University, Evanston, IL

AFM Study of Water Meniscus Formation Between an AFM Tip and NaCl Substrate
Sergey Rozhok, Northwestern University, Evanston, IL

From Random Attachment to Single Cell Specified Arrangements
Sergey Rozhok, Northwestern University, Evanston, IL

Electrochemical Control of DPN-generated Nanostructures
Khalid Salaita, Northwestern University, Evanston, IL

Tuesday, January 27, 2004

0800 - 0830 Continental Breakfast

0830 - 0915 **Plenary Talk – Scanning Probe Cantilevers Operating in New Modes**
Cal F. Quate, Stanford University, Stanford, CA

0915 - 0945 **Nanoscale Patterning of Semiconductor Surfaces with Scanning Probe Microscopy**
Jillian M. Buriak, University of Alberta, Edmonton, Alberta, Canada

0945 - 1015 **Dip-Pen Nanolithography for Nanoscale Biosensing and Photonic Applications**
David Ginger, University of Washington, Seattle, WA

1015 - 1030 Break

1030 - 1100 **Examining and Controlling Molecular Flow in DPN**
Paul Sheehan, Naval Research Laboratory, Washington, DC

1100 - 1130 **Rapid Prototyping of Hybrid Nanoscale Devices via Dip-Pen Nanolithography**

Seunghun Hong, Seoul National University, Seoul, Korea

1130 - 1200 **Controlled Deposition of Bio-Inorganic Catalyzing Molecules Via Electrostatic Dip-Pen Nanolithography**
Morley O. Stone, AFRL/ML, Wright-Patterson AFB, OH

1200 - 1330 Lunch Break

1330 - 1400 **Using Dip-Pen Nanolithography and Two-step Nanografting to Investigate Assembly of Virus Nanostructures at Chemoselective Templates**
James J. DeYoreo, Lawrence Livermore National Laboratory, Livermore, CA

1400 - 1430 **Building an Interface to Biomolecular Processes**
Jeff M. Byers/David Pena, Naval Research Laboratory, Washington, DC

1430 - 1500 **Dip-Pen Nanolithography: Towards Industrial Nanofabrication**
Joe Fragala, NanoInk, Inc.

1530 - 1545 Break

1545 - 1715 **Panel Discussion – Future Directions and Applications of DPN**

1715 - 1730 **Closing Remarks**

SUMMARY OF REVIEWS
AFOSR Molecular Dynamics/Theoretical
Chemistry Review Panel Meeting
20 June 2003

03-NL-072 **Simulation of Reactions for the Design of Energetic Materials, Resistant Coatings and Laser Protection Devices**

-Sharon Hammes-Schiffer, Pennsylvania State University

Bruce C. Garrett, Pacific Northwest National Laboratory (A / 2)
James T. Hynes, Ecole Normale Superieure (A / 1)
John Tully, Yale University (A+ / 1)
Albert F. Wagner, Argonne National Laboratory (/)

03-NL-074 **Multi-Scale Simulation of High Energy Density Ionic Liquids**

-Gregory A. Voth, University of Utah

Bruce C. Garrett, Pacific Northwest National Laboratory (A- / 2 – 3)
Nancy Makri, University of Illinois (A / 2)
John W. Mintmire, Oklahoma State University (A / 1)
James L. Skinner, University of Wisconsin (no grade)

03-NL-075 **Model Chemistry of Reactive Species Based on Electron Geminals**

-Vitaly A. Rassolov, University of South Carolina

John W. Mintmire, Oklahoma State University (A / 1)
Albert F. Wagner, Argonne National Laboratory (/)
Martin Head-Gordon, University of California, Berkeley (B+ / 1)

03-NL-078 **Oxide-Supported Metal Nanoclusters: Structure, Dynamics, and Chemical Properties**

-Gyeong S. Hwang, The University of Texas at Austin

James B. Adams, Arizona State University (B / 1)
Bruce C. Garrett, Pacific Northwest National Laboratory ()
Jens K. Norskov, Technical University of Denmark (A- / 1)

03-NL-087 **New Tools for the Study of Combustion Chemistry and complex Gas-Surface Interactions from First Principles**

-Andrew M. Rappe, University of Pennsylvania

Bruce C. Garrett, Pacific Northwest National Laboratory ()
Mei-Yin Chou, Georgia Institute of Technology (A- / 2)
John W. Mintmire, Oklahoma State University (A / 1)
James B. Adams, Arizona State University (A- / 2 (3 for QMC part))

03-NL-089 **Rovibrational Dynamics and Energy Transfer Mechanisms in Bulk Solid Hydrogen and Surface-Adsorbed Hydrogen Layers**
-Robert J. Hinde, University of Tennessee

Nancy Makri, University of Illinois (A / 2)
Bruce C. Garrett, Pacific Northwest National Laboratory (A / 1 – 2)
John W. Mintmire, Oklahoma State University (A- / 2)
James L. Skinner, University of Wisconsin (no grade)

03-NL-095 **Innovative Methodology for Accelerated Quantum Molecular Dynamics**
-Michael Johnson, CogniTech Corporation

John W. Mintmire, Oklahoma State University (B+ / 1)
Peter J. Rossky, University of Texas (C / 1)
Nancy Makri, University of Illinois (B / 2)

03-NL-101 **Accurate Thermochemistry From Group Additivity and Ab Initio Methods via Response Reactions**
-Ravindra Datta, Worcester Polytechnic Institute

Bruce C. Garrett, Pacific Northwest National Laboratory (B / 2 – 3)
Karl K. Irikura, National Institute for Standards & Technology (B+ / 1)
Albert F. Wagner, Argonne National Laboratory ()

03-NL-103 **Metastable Molecules in the Ground and in Excited States: Theory Development, Implementation and Application**
-Rodney J. Bartlett, University of Florida

Martin Head-Gordon, University of California, Berkeley (A- / 1)
John Stanton, University of Texas at Austin (A / 1)
Albert F. Wagner, Argonne National Laboratory (/)

03-NL-121 **Theoretical Studies of Gas Phase Elementary Reations**
-Keiji Morokuma, Emory University

Albert F. Wagner, Argonne National Laboratory (/)
Todd J. Martinez, University of Illinois (A / 1)
Donald Truhlar, University of Minnesota (A+ / 1)

02-NL-357 **Coherent Quantum Control of Mulitdimensional Vibrational Spectroscopy**
-Shaul Mukamel, University of Rochester

John W. Mintmire, Oklahoma State University (A- / 4)
Warren S. Warren, Princeton University (no grade)
John Wright, University of Wisconsin (no grade)

03-NL-006 **Hole Catalyzed Aromatization of Small Organic Molecules**
-Paul G. Wenthold, Purdue University

Kit H. Bowen, John Hopkins University (A- / 4-5)
Kent M. Ervin, University of Nevada (A- / 2)
Mark Johnson, Yale University (B / 4)

03-NL-067 **Ultrafast Soft X-Ray Probing of Core Level Molecular Dynamics**
-Stephen R. Leone, University of California, Berkeley

Kit H. Bowen, John Hopkins University (A+ / 2)
Erwin Poliakoff, Louisiana State University (A / 2)
Arthur Suits, State University of New York at Stony Brook (A+ / 2)
Robert L. Whetten, Georgia Institute of Technology (A- / 3)

03-NL-073 **Electro-optic Materials based upon Inorganic Semiconductor Nanorod Liquid Crystals**
-A. Paul Alivisatos, University of California, Berkeley

Sanford Asher, University of Pittsburg (A / 3)
Kit H. Bowen, John Hopkins University (A+ / 3)
Robert L. Whetten, Georgia Tech (B / 3)

03-NL-076 **Photoabsorption Spectroscope of Free Silver and Gold Nanoclusters as a Probe of their Surface Electronic Structure**
-Vitaly V. Kresin, University of Southern California

Pat Collier, California Institute of Technology (A- / 3)
James M. Lisy, University of Illinois (B – C / 2)
Robert L. Whetten, Georgia Institute of Technology (A / 1)

Lukas Novotny, University of Rochester (no grade)

03-NL-079 **Development of a Miniaturized Hadamard Transform Time-of-Flight Mass Spectrometer**
-Richard N. Zare, Stanford University

Kit H. Bowen, John Hopkins University (A / 2-3)
James M. Farrar, University of Rochester (A / 2)
James M. Lisy, University of Illinois (B+ / 2)
David Lubman, University of Michigan (A+ / 1)

03-NL-080 **Experimental and Theoretical Investigation of Collisional Energy Transfer in Free Radicals of Atmospheric Importance**
-Paul J. Dagdigian, John Hopkins University

Mark Johnson, Yale University (A- / 1)
H. Floyd Davis, Cornell University (B+ / 3)
Piergiorgio Casavecchia, Universita' di Perugia (A / 1)

03-NL-082 **Cluster Dynamics: Laying the foundations for developing Nanoscale materials**
-A. W. Castleman, Pennsylvania State University

Kit H. Bowen, John Hopkins University (A+ / 1)
Mark B. Knickelbein, Argonne National Laboratory (A / 1)
Michael Morse, University of Utah (B+ - A- / 3)
Robert L. Whetten, Georgia Institute of Technology (A / 1)

03-NL-085 **Quenching Dynamics of ElectronicallyExcited Hydroxyl Radicals**
-Marsha I. Lester, University of Pennsylvania

H. Floyd Davis, Cornell University (B+ / 2)
Mark Johnson, Yale University (A+ / 2)
Piergiorgio Casavecchia, Universita' di Perugia (/)

03-NL-090 **The Chemistry of Cyclic All-Nitrogen Molecules**
-Alec M. Wodtke, University of California, Santa Barbara

Mark Johnson, Yale University (A / 3)
Arthur Suits, State University of New York at Stony Brook (B+ / 1)
Paul L. Houston, Cornell University (A / 1)
Robert L. Whetten, Georgia Institute of Technology (A / 3)

03-NL-091 **Spectroscopic Characterizationof Metastable Radical Nanoclusters in Helium Droplets**
-Roger E. Miller, University of North Carolina at Chapel Hill

Mark Johnson, Yale University (A / 1)
James M. Lisy, University of Illinois (A / 1)
Andrey Vilesov, University of Southern California (A / 1)
Ken Janda, University of California (no grade)

03-NL-098 **Time Resolved Energy Transfer and Photodissociation of Vibrationally Excited Molecules in Solution**
-F. Fleming Crim, University of Wisconsin, Madison

James M. Lisy, University of Illinois (A – A- / 3)
Mark Johnson, Yale University (A / 2)
Philip Reid, University of Washington (A- / 1)
Edwin J. Heilweil, National Institute for Standards & Technology (B+ / 1)

03-NL-118 **Atomic and Molecular Manipulation of Chemical Interactions**
-Wilson Ho, University of California, Irvine

James M. Lisy, University of Illinois (A- / 4)
Robert L. Whetten, Georgia Institute of Technology (A- / 2)
Paul S. Weiss, The Pennsylvania State University (A – A- / 1)
Flemming Bessenbacher, University of Aarhus (A+ / 1)

02-NL-358 **Nucleation and Growth of Hetermolecular Water Clusters in the Gas Phase**
-Elliot Bernstein, Colorado State University

Kit H. Bowen, John Hopkins University (no grade)
James M. Lisy, University of Illinois (B / 1)
Mitchio Okumura, California Institute of Technology (no grade)

ANNUAL REPORT

CHEMISTRY AND LIFE SCIENCES RESEARCH PROGRAM

CONTRACT NO. F49620-00-C-0009

Period of Performance: 3/1/02 – 2/28/03

Prepared For:

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

CHEMISTRY AND LIFE SCIENCES DIRECTORATE

Dr. Genevieve Haddad, Program Manager

Presented By:

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

INTRODUCTION

UES, Inc. is providing research evaluation services to the Directorate of Chemistry and Life Sciences, Air Force Office of Scientific Research (AFOSR), in subareas that include Neurosciences (e.g., Neurochemistry, Biology, Electrophysiology, Neuroanatomy, Multisensory Integration/Spatial Orientation, Cardiovascular Physilogy, and Bioenvironmental Hazards; Psychophysics, Psychophysiology, Physiological Psychology, Sensation, Perception, Cognition); Computer Sciences (e.g., Vision and Robotics); Otolaryngology; Meteorology, Chemistry (e.g., computational chemistry, polymeric and organic materials, photonic materials, inorganic and surface chemistry, high density materials); Biotechnology (e.g., materials and processes); and Fuels (e.g., petroleum and synthetic); and in related programs under development.

The services provided by UES, Inc. include: selecting qualified scientists to evaluate proposals, assembling scientific groups to evaluate, analyze and advise on content and direction of Chemistry and Life Sciences Programs; organizing workshops to assist in the definition of new basic research areas proposed by the Chemistry and Life Sciences Directorate; providing advisors to make presentations and assist government personnel with analyzing areas of relevant science; and providing advisors to assist and advise on site visits to research laboratories.

The fifth option year included: 60 Proposals that were reviewed;
6 Program/Contractor Reviews and 3 Workshops.

A. Evaluations of Individual Research Proposals

UES sent out 60 proposals to evaluators during the performance period of 1 March 2002 through 28 February 2003.

UES has been providing the Director of Chemistry and Life Sciences a Summary of Proposals Under Review (SPUR) report on a biweekly basis. This report is now being sent electronically as well as a hard copy. This report is composed of the UES log sheet indicating the proposals sent out, the names of the evaluators to whom the proposals were sent, the dates the proposals were mailed, the tickle date, any necessary comments, and the date the reviews were received. This allows the Program Managers to have a current listing of all proposal activity.

B. Contractor/Program Reviews

1. The first program review was for **Electrochemistry Review**, Lowes Annapolis Hotel, Annapolis, MD, 4-7 March 2002. Lt. Col. Paul Trulove, Program Manager.
Total: 67
speakers :21
posters:23
attendees: 23

2. The second program review was **BioInspired Concepts Theme** Review, Lowes Annapolis Hotel, Annapolis, MD, 29-30 April 2002. Dr. Walter Kozumbo, Program Manager. 37 Attendees

3. The third program review was **Polymer Matrix Composite** Program Review, Hyatt Regency Long Beach, Long Beach, CA, 17-18 May 2002. This program addresses the materials science issues relating to developing improved performance or lower cost polymer matrix composite (PMC) systems and to processing and utilizing these structures for AF systems. UES provided on-site support, abstract booklets and made all arrangements for the meeting. Nineteen of the 46 attendees were speakers.
Dr. Charles Lee, Program Manager.

4. The forth program review was **Molecular Dynamics/Theoretical Chemistry (MD/TC)** Contractor's Meeting, The Westin Waltham-Boston Hotel, Waltham, MA, 20-22 May 2002. Dr. Michael Berman, Program Manager
Speakers:31
Attendees: 78
Posters:25

5. The fifth program review was **MURI** Program Review, The Westin Waltham-Boston Hotel, Waltham, MA, 23 May 2002. Dr. Michael Berman, Program Manager. 24 attendees, 12 Speakers

6. The Sixth program review was **Biomimetics, Biomaterials and Biointerfacial Sciences** Program Review, Hawk's Cay Resort, Duck Key, FL, 2-7 February 2003. Dr. Hugh C. De Long, Program Manager.

C. Workshops

1. **Software Systems and Information Fusion Workshop**, Embassy Suites, Syracuse, NY, 3-7 June 2002. Dr. Herklotz and Dr. John Tangney, Program Manager.

2. **Workshop on Nanoscience Approaches to Multifunctional Coatings,** Keystone Resort and Conference Center, Keystone, CO, 12-17 August 2002. Lt. Col. Paul Trulove, Program Manager.

3. **Workshop on Energetic Ionic Liquids,** Executive Conference and Training Center at Dulles, Dulles, VA, 9-10 October 2002. Dr. Michael Berman, Program Manager.

E. Advisors

In addition to advisors provided for Program Reviews, Workshops and Panel Meetings, UES provided travel, per diem and in many cases, honorarium for the following advisors:

Garth L. Wilkes and Madhu S. Madhukar, **Polymer Matrix Composite Program Review,** Long Beach, CA, 16 May 2002.

Jeffery Fisher, Gerldine Grant, Ivan L. Cameron, Terence Risby, and Errol Zeiger, **JP-8 Jet Fuel,** Brooks AFB, TX, 15 May 2002.

Mark Hildebrand, Nancy J. Halas, Uwe B. Sleytre, Martin W. Kendig, Joseph Osborne, H. Garry Pippin, Jonathan W. Martin, Ray Taylor, Steven Sibener, Mehmet Sarikaya, Jeffrey Brinker, Don Baer, Ras Pandey, and Arun Yethiraj, **Nanoscale Approaches to Multifunctional Coatings Workshop**, Keystone, CO, 12-16 August 2002.

Eduardo Salas, **MURI Third Year Review**, Fairborn, OH, 26 September 2002.

James V. Bruckner, Jeff Fisher, Rory Conolly, Deborah Keys, and Sayed Hassan, **JP-8 Jet Fuel**, 21 November 2002.

J. D. Kelley, **AIAA Meeting,** Reno, NV, 6-9 January 2003.

Ronald Eby and Nicholas Spencer, **Biomimetics, Biomaterials, and Biointerfacial Sciences Program Review**, Hawks Cay, FL, 3-7 February 2003.

SUMMARY

UES is pleased to continue to perform the specific tasks assigned to them in accordance with provisions of the contract. Participants will continue to be Dr. Thomas Eggemeier as Program Manager, Judith M. Flory, Program Administrative Manager and Amiee Nichols as Program Assistant. UES personnel appreciate the opportunity to be of service to AFOSR in this interesting and worthwhile program.

LIST OF APPENDICES

BREAKDOWN OF RESEARCH PROPOSALS BY PROGRAM MANAGER

PROGRAM MANAGER	NO. OF PROPOSALS
Berman	24
De Long	1
Kozumbo	4
Larkin	4
Lee	15
Sorkin	3
Tangney	1
Trulove	5

AFOSR/ONR Electrochemistry Science and Technology Review
Lowes Annapolis Hotel
Annapolis, MD

4-6 March 2002

Monday, 4 March 2002

1245 – 1300 Introduction and Remarks

1300 – 1330 ***Thermal Stability and Compatibility Studies of Imidazolium and POSS Layered Silicates and Imidazolium Graphite***
Jeffrey W. Gilman – National Institutes of Standards and Technology, Gaithersburg, MD

1330 – 1400 ***Advanced Materials for Rechargeable Li Batteries***
Donald R. Sadoway and Anne Mayes – Massachusetts Institute of Technology, Cambridge, MA

1400 – 1430 ***Lithium-Ion Conducting Channels***
Lawrence G. Scanlon – Air Force Research Laboratory, AFRL/PRPS, Wright-Patterson AFB, OH

1430 – 1500 ***Sol-Gel Electrochemical Materials and Electrode Structures***
Bruce S. Dunn – UCLA, Los Angeles, CA

1500 – 1530 **Break**

1530 – 1600 ***Three-Dimensional Architectures for Charge Storage***
Debra R. Rolison and Jeffrey W. Long – Naval Research Laboratory, Washington, DC

1600 – 1630 ***Applications of Dendrimer-Encapsulated Metal Nanoparticles to Lithium Battery Technology***
Richard M. Crooks – Texas A&M University, College Station, TX

1630 – 1730 **Oral synopses of presentations in Poster Session I**

Monday, 4 March 2002 Continued

1800 – 2100 Poster Session I/Reception

Nanogel Electrolytes
Emmanuel P. Giannelis – Cornell University, Ithaca, NY

Bioinspired Materials for Compact Power Structures
Chad Mirkin – Northwestern University, Evanston, IL

Creation of Metal and Semiconductor Nanostructures using DPN Nanolithography Techniques
Jie Liu – Duke University, Durham, NC

Three-Dimensional Architectures for Electrochemical Power Sources
Bruce Dunn – UCLA, Los Angeles, CA

Electrochemical Kinetics and Transport at Nanoscale Dimensions
Henry S. White – University of Utah, Salt Lake City, UT

NMR Studies of Ion Transport in Polymer Electrolytes
Steve Greenbaum – Hunter College/CUNY, New York, NY

Room Temperature Ionic Liquids as Suporting Electrolytes in Electroactive Polymer Based Supercapacitors
John D. Stenger-Smith – China Lake NAWCWD, China Lake, CA

Surface Electrochemistry of Catalytic Reactions at 25-80 °C
Carol Korzeniewski – Texas Tech University, Lubbock, TX

Direct-Oxidation Fuel Cells
R. J. Gorte, J. M. Vohs, and W. L. Worrell – University of Pennsylvania, Philadelphia, PA

Fuel Cell Plant Modeling and Simulation
Roger Dougal and Ralph White – University of South Carolina, Columbia, SC

Nanotubule Membranes – Fundamentals and Applications in Electrochemical Energy and Stochastic Sensing
Charles R. Martin – University of Florida, Gainsville, FL

Tuesday, 5 March 2002

0730 – 0800 **Continental breakfast**

0800 – 0830 ***Charge Transfer Reaction Inverse Photoemission Spectroscopy***
Rudolph A. Marcus – California Institute of Technology, Pasadena, CA

0830 – 0900 ***Redox Cycling of Manganese on Metal Surfaces and Its Consequences for Material Performance***
Zbignew Lewandowski – Montana State University, Bozeman, MT

0900 – 0930 ***Electrodeposition of Transition Metal Aluminum Alloys***
Charles L. Hussey – The University of Mississippi, University, MS

0930 – 1000 **Break**

1000 – 1030 ***Surface Reaction Fundamentals in Direct Oxidation Hydrocarbon Fuel Cells***
Eric M. Stuve – University of Washington, Seattle, WA

1030 – 1100 ***New Binary and Ternary protonated Glasses: Preparation and Characterization***
Steve W. Martin – Iowa State University, Ames, IA

1100 – 1130 ***Electrochemical Membrane Separation of H_2S***
Jack Winnick and Meilin Liu – Georgia Institute of Technology, Atlanta, GA

1130 – 1300 **Lunch**

1300 – 1330 ***Vapor Sensing Using Dynamics of Electron Transfers Between Nanoparticles***
Royce W. Murray – The University of North Carolina-Chapel Hill, Chapel Hill, NC

1330 – 1400 ***Hybrid Core-Shell Nanoparticles-Synthesis and Applications***
SonBinh T. Nguyen – Northwestern University, Evanston, IL

1400 – 1430 ***Properties of Fuel Cell and Battery Materials***
J. J. Fontanella and C. A. Edmondson – US Naval Academy, Annapolis, MD

1430 – 1530 **Oral synopses of presentations in Poster Session II**

Tuesday, 5 March 2002 Continued

1530 – 1800 Break and Poster Session II

Microsensor Design
Daniel G. Nocera – MIT, Cambridge, MA

Solid State NMR of Polymer Nanocomposites
Steve Greenbaum – Hunter College of CUNY, New York, NY

Supramolecular Engineering of Lithium Ion Conducting Electrolytes
John Arnold – University of California, Berkeley, CA

Nanobiohybrides: Models for Biomembranes and Sensors
Emmanuel P. Giannelis – Cornell University, Ithaca, NY

Spectro-Electrochemical Studies of Nanophase Vanadium Oxides
Azzam N. Mansour – NSWC, Carderock Division, West Bethesda, MD

Reactivity Mapping of Catalyst Gradients and Arrays with Scanning Electrochemistry and Mass Spectrometry
Andrew C. Hillier – University of Virginia, Charlottesville, VA

Preparation and Characterization of Nanostructured Materials for Solid-State Electrochemical Applications
Maryanne M. Collinson – Kansas State University, Manhattan, KS

New Solid Acids for Fuel Cells
Sossina M. Haile – California Institute of Technology, Pasadena, CA

Carbon Microfiber High Electrolyte Penetration (HElP) Electrodes
Russel R. Bessette – University of Massachusetts Dartmouth, Dartmouth, MA

Intermetallics as Electrocatalysts and Logistic Fuels for Fuel Cell Applications
Héctor D. Abruña – Cornell University, Ithaca, NY

Electrochemical Membrane Separation of H_2S
Alan Burke, Jack Winnick, and Meilin Liu – Georgia Institute of Technology, Atlanta, GA

Wednesday, 6 March 2002

0730 – 0800 **Continental breakfast**

0800 – 0830 ***Nanostructured Electrochemically Active Systems for Li-Ion Batteries***
P. N. Kumta – Carnegie Mellon University, Pittsburgh, PA

0830 – 0900 ***Development of Electrochemical Capacitor Technology for DoD Applications***
Allen W. Apblett – Oklahoma State University, Stillwater, OK

0900 – 0930 ***Templated Macroporous Solids as Potential Nanostructured Electrode Materials***
Kenneth R. Poeppelmeier – Northwestern University, Evanston, IL
Andreas Stein – University of Minnesota, Minneapolis, MN

0930 – 1000 **Break**

1000 – 1030 ***Improved Performance of Energy Storage Devices: Potential Areas for Dendridic Chemistry Involvement***
George R. Newkome – University of Akron, Akron, OH

1030 – 1100 ***Smart Polymeric Gels as an Environment for Electrochemistry***
Maggie Ciszkowska – Brooklyn College, CUNY, Brooklyn, NY

1100 – 1130 ***Ionic Liquid/Polymer Electrolytes***
Thomas E. Sutto and Hugh C. De Long – US Naval Academy, Annapolis, MD

1130 **Closing Remarks/Meeting Ends**

2002 Polymer Matrix Composite Review
Hyatt Regency Long Beach
Long Beach, CA

Friday, 17 May 2002- (Beacon B Conference Room)

0830 – 0840 **Welcoming And Introduction**
C. Lee, Air Force Office of Scientific Research

0840 – 0910
R.A. Pethrick and D. Hayward, University of Strathclyde, UK

0910 – 0940 **Dielectric Spectroscopy as a Non-Destructive Inspection Tool to Assess Ageing of Adhesively Bonded Structures**
J. Mijovic & H. Zhang, Polytechnic University, Brooklyn, NY

0940 – 1010 **Development, Processing and Characterization of Electron Beam Cured Polymers and Composites**
R.J. Morgan, Texas A&M University, College Station, TX

1010 – 1030 **BREAK**

1030 – 1100 **Cryogenic Cycling of Polymeric Composites: Processing and Matrix Modification Effects on Transverse Microcracking**
J.C. Seferis, University of Washington, Seattle, WA

1100 – 1130 **Development of Processible, Low Cure Shrinkage Adhesives for Aerospace Applications**
C. Leung, PolyComp Technologies, Inc., Del Mar, CA

1130 – 1200 **Hydrostatic Stress Development in Composite Resins: Modeling, Measurement and Mitigation Strategies**
G.B. McKenna and S.L. Simon, Texas Tech University, Lubbock, TX

1200 – 1300 **LUNCH**

1300 – 1330 **Investigation of Adhesive Joints for Nano-Engineering and Modeling**
C.H. Jenkins & R.M. Winter, South Dakota School of Mines & Technology, Rapid City, SD

1330 – 1400 **Development of High Temperature LowViscosity Phenylethynyl(PE)End-capped Fluorinated Polyimides For Adhesive Applications**
D.A. Scola, University of Connecticut, Storrs, CT

1400 – 1430 **High Performance Composites Processing and Durability**
D.B. Curliss, US Air Force Research Laboratory, Wright-Patterson AFB, OH

1430 – 1450 **BREAK**

1450 – 1520 **High Performance Thermoset/Layered Silicate Nanocomposites**
D.R. Dean, Tuskegee University, Tuskegee, AL

1520 – 1550 **Chemically Functionalized Clay Epoxy Nanocomposites for Aerospace Applications**
D. Raghavan, Howard University, Gaithersburg, MD

1550 – 1620 **Composites Containing Carbon Nanofibers and/or Polyhedral Oligomeric Silsesquioxanes**
C.U. Pittman Jr., Mississippi State University, Starkville, MS

1620 – 1650 **Characterization of Variability in Prepreg Microstructures**
G. Dillon, The Pennsylvania State University, State College, PA

1650 **End of Day**

Saturday, 18 May 2002

0815 – 0845 **FAST Center Research on Cryogenic and High Temperature Cycling of Advanced Composites and their Effects on the Mechanical, Microstructure, and Permeability of the Composites**
P.O. Biney, FAST Center at Prairie View A&M University, Prairie View, TX

0845 – 0915 **Model-Based Design for Polymer Matrix Composites Thermal Fatigue Life**
G.A. Schoeppner, Materials and Manufacturing Directorate, Structural Materials Branch (MLBC), Wright-Patterson AFB, OH

0915 – 0945 **Fiber/Matrix Interphase Development During Processing of Thermosetting-Matrix Composites**
R. Pitchumani, University of Connecticut, Storrs, CT

0945 – 1000 **BREAK**

1000 – 1030 **Polymer Nanocomposite Ablatives: Synthesis and Characterization**
J. Koo, Systems and Materials Research Consultancy, Spicewood, TX

1030 – 1100 **Perfluorocyclobutane (PFCB) polyaryl ethers for Space-based Applications**
A. Gavrin, J. Nebo, and N. Rice, Triton Systems, Inc., Chelmsford, MA

1100 – 1130 **Direct Formation of Silane Coupling Agents on Continuous Fiber SiO_2 Surfaces for Improved Composite Performance**
D. Boyles, W. Cross and J. Kellar, South Dakota School of Mines and Technology, Rapid City, SD

1130 **End of Day**

2002 AFOSR Molecular Dynamics Contractors Review

The Westin Waltham-Boston Hotel
Waltham, MA

20 – 22 May 2002

Sunday, 19 May 2002

5:00-7:00 PM Registration

Monday, 20 May 2002

8:00 AM **Registration and Continental Breakfast**

Session Chair: TBD

8:30 Hyperthermal Dynamics in the Space Environment
R. A. Dressler, Hanscom AFB, MA

9:00 Potential Energy Surfaces for Ion-Molecule, Chemical Laser and Photodissociation Processes
K. Morokuma, S. Irle, P. Zhang, G. P. Phillips, D. V. Khoroshun and Q. Wang, Emory University, Atlanta, GA

9:30 Spectroscopy and Dynamics of Transient Energetic Species and Dissociative Recombination Dynamics of Molecular Cations
R. E. Continetti, University of California, San Diego, La Jolla, CA

10:00 **Break**

Session Chair: TBD

10:30 Solvent Effects in Transition State Spectroscopy
D. M. Neumark, University of California, Berkeley, Berkeley, CA

11:00 The Chemical Dynamics of Highly Vibrationally Excited Diatomic Ions of Aerospace Relevance
C-Y. Ng[1] and R. A. Dressler[2]
[1]*Department of Chemistry, Iowa State University, Ames*
[2]*Air Force Research Laboratory, Hanscom AFB, MA*

11:30 Studying the Gas/Surface Interface Under Hyperthermal Energy Conditions
D. C. Jacobs, University of Notre Dame, Notre Dame, IN

12:00 Lunch Buffet in Restaurant

Monday, 20 May 2002 – Continued

Session Chair: TBD

1:30 Rate Constants and Product Distributions for Dissociative Recombination of Hydrocarbon Ions
A. A. Viggiano[1], M. Larson[2], S. T. Arnold[1], S, Kalhori[2], S. Rosen[2], J. Semaniak[4], A. Derkatch[2] and M. af. Ugglas[3]
[1]AFRL Space Vehicles Directorate, Hanscom AFB, MA
[2]Department of Physics University of Stockholm, Stockholm, Sweden
[3]Manne Siegbahn Laboratory, Stockholm, Sweden
[4]Institute of Physics, Swietokrzyska Academy, Kielce, Poland

2:00 Femtosecond Soft X-Ray Pump-Probe Dynamics
S. R. Leone and V. M. Bierbaum,
University of Colorado, Boulder, CO

2:30 Interrogating Superfluidity on Molecular Scales: Experiment and Theory
V. A. Apkarian, University of California, Irvine, Irvine, CA

3:00 **Break**

3:30 Ultrafast Multi-dimensional Infrared Spectroscopy of Gases at Low and High Pressures
M. Fayer, Stanford University, Stanford, CA

4:00 Fast Vibrational Spectroscopy of Shock Compression and Combustion
D. D. Dlott, University of Illinois at Urbana Champaign, Urbana, IL

4:30 Energy Transfer and Vibrationally Mediated Photodissociation in Gases and Liquids
F. F. Crim, University of Wisconsin – Madison, Madison, WI

7:30 PM Poster Session and Reception

Tuesday, 21 May 2002

8:00 AM **Registration and Continental Breakfast**

Session Chair: TBD

8:30 Oxidation of Alkyl Ions, $C_nH_{2n+1}^+$ (n=1-5), in Reactions with O_2 and O_3 in the Gas Phase
S. Williams, T. M. Miller,† W. B. Knighton, A. J. Midey,† and A. A. Viggiano Air Force Research Laboratory, Hanscom AFB, MA

9:00 IR Laser Studies of State-to-State Reaction Dynamics
D. J. Nesbitt, University of Colorado and National Institute of Standards and Technology, University of Colorado, Boulder, CO

Tuesday, 21 May 2002 – Continued

9:30 Predissociation and Quenching Dynamics of Electronically Excited Hydroxyl Radicals
M. I. Lester, University of Pennsylvania, Philadelphia, PA

10:00 **Break**

Session Chair: TBD

10:30 Interactions of Hydrocarbon Fuels with Thermospheric Oxygen Atoms
S. J. Lipson, S. M. Miller, J. A. Dodd, R. D. Sharma, K. J. Castle[1], *J. B. Lipson[2] and E. S. Hwang[2]*
Air Force Research Laboratory, Space Vehicles Directorate, Hanscom AFB, MA
[1]National Research Council Postdoctoral Research Associate
[2]Stewart Radiance Laboratory, Bedford, MA

11:00 Molecular Triplet States: Excitation, Evolution, Unintended Diagnostics, and Detection
R. W. Field, S. Altunata, R. L. Thom and A. P. Mishra,
Massachusetts Institute of Technology, Cambridge, MA

11:30 Molecular Beam Studies of Collisions of Protic Gases with Stratospheric Sulfuric Acid
G. M. Nathanson, University of Wisconsin, Madison, WI

12:00 PM **Lunch Buffet in Restaurant**

Session Chair: TBD

1:30 Hadamard Transform Time-Of-Flight Mass Spectrometry
R. N. Zare, Stanford University, Stanford, CA

2:00 Kinetics and Dynamics Related to Chemical Laser Systems
M. C. Heaven, Emory University, Atlanta, GA

2:30 Velocity Map Imaging Investigations of ClN_3 Photochemistry
A. Wodtke, University of California, Santa Barbara, Santa Barbara, CA.

3:00 **Break**

3:30 Program Status
M. R. Berman, Air Force Office of Scientific Research, Arlington, VA

4:00 **Discussion Session:** Molecules for Quantum Computation
Guest Speaker: Isaac Chuang, Massachusetts Institute of Technology

Tuesday, 21 May 2002 – Continued

7:30 PM FTIR Studies of Water Adsorbed on MgO(100)
H. Reisler and C. Wittig, University of Southern California, Los Angeles, CA

8:00 PM Cluster Dynamics: Foundations for Developing Nanoscale Materials
A. W. Castleman, Jr., Pennsylvania State University, University Park, PA

8:30 PM Infrared Laser Spectroscopy of Gas Phase Metal Ion Complexes
M. A. Duncan, University of Georgia, Athens, GA

Wednesday, 22 May 2002

8:00 AM **Registration and Continental Breakfast**

Session Chair: TBD

8:30 Studies on the Production of the Pentazole Anion and Singlet-Delta Molecular Oxygen
K. O. Christe, Air Force Research Laboratory, Edwards AFB, CA

9:00 Optimizing the Growth and Properties of Al_2O_3/W Nanolaminates Fabricated Using Atomic Layer Deposition Techniques
S. M. George, University of Colorado, Boulder, CO

9:30 Insights into Ceramic Coating Adhesion on Nickel
E. A. Jarvis, A. Christensen and E. A. Carter
University of California, Los Angeles, Los Angeles, CA

10:00 **Break**

Session Chair: TBD

10:30 Virtual Design and Testing of Materials: A Multiscale Approach
W. Curtin, Brown University

11:00 Catalytic Activity by Metal Nanoclusters Supported on Oxide Surfaces
H. Metiu, University of California, Santa Barbara, CA

11:30 Multidimensional Surface-Enhanced Sensing and Spectroscopy
R. P. Van Duyne[1], G. C. Schatz[1] and K. G. Spears[1], D. M. Jonas[2], K. L. Rowlen[2], P. W. Bohn[3], A. Campion[4], S. Nie[5] and L. E. Brus[6]
[1]Northwestern University
[2]University of Colorado, Boulder, CO
[3]University of Illinois Urbana-Champaign,
[4]University of Texas at Austin, Austin, TX
[5]University of Indiana
[6]Columbia University

12:00 PM Closing Remarks, Adjourn

MURI Program Review
Virtual Design and Testing of Materials: A Multiscale Approach

May 23, 2002
Westin Hotel, Waltham, MA
Supported by U.S. Air Force Office of Scientific Research, Dr. M. Berman, Program Monitor

Participants:

MURI Investigators:

E. Carter (UCLA), G. Cedar (MIT), W. Curtin (Brown, PI), E. Kaxiras (Harvard), A. Needleman (Brown), M. Ortiz (Cal Tech), R. Phillips (Cal Tech)

Invited Participants (tentative):

A. Voter (LANL), T. Arias (Cornell), R. Miller (Carleton U.), W. E (Princeton)

Draft Schedule

7:30 am	Continental Breakfast
8:00 am	Intro to the MURI Program: Goals and Structure of the Review (Curtin)
8:30 am	Progress in "Basic Methods":
8:30 am	Orbital-free Density Functional Methods (Carter; Kaxiras/Choly)
9:00 am	First-principles Models of Decohesion (Ceder; Kaxiras)
9:30 am	Discrete Dislocation Modeling of Fatigue (Needleman)
10:00 am	Progress in "Informing Higher-scale Models":
10:00 am	Dislocation Phenomena from First-Principles (Lu/Kaxiras)
10:30 am	Break
10:45 am	Quantum/Continuum Coupling via Cohesive Zones (Carter and Ortiz)
11:15 am	Stress-dependent Diffusion and Dislocation Dynamics (Olmsted/Curtin/Phillips)
11:45 am	Modeling 3d Dislocation Phenomena in 2d (Benzerga/Needleman)
12:15 pm	Lunch
1:15 pm	Progress in "Direct Scale Coupling (Length and Time)":
1:15 pm	Quantum/Atomistic Coupling (Choly/Kaxiras)
1:45 pm	Quantum/Atomistic Coupling in the Quasicontinuum Method (Carter and Ortiz)
2:15 pm	Bridging Atomistic and Continuum Models of Defects (Curtin)
2:45 pm	Coarse Graining of Dynamics: Bridging Time Scales (Ceder)
3:15 pm	Molecular Dynamics and the Quasicontinuum Model (Phillips)
3:45 pm	Break
4:00 pm	Discussion of Future Directions
5:00 pm	Adjourn

2003 AFOSR Biomimetic, Biomaterial and Biointerfacial Sciences Program Review

Hawk's Cay Resort
Duck Key, FL

3-7 February 2003

Sunday, 2 February 2003 **Registration and Reception, 5:00 to 7:00 PM**

Monday, 3 February 2003

0815 **Opening Remarks – Hugh De Long**
Air Force Office of Scientific Research, AFOSR/NL

Directed/Self Assembly

0830 ***Evolving Biomolecular Control and Assembly of Semiconductor and Magnetic Nanostructures***
Angela Belcher, Massachusetts Institute of Technology

0910 ***Self-Assembly of Bio-Inspired Nanostructures***
Jeffrey Brinker, University of New Mexico

0950 **Break**

1020 ***Design and Development of Nanoscale Biomotor Power Units***
Richard Holtz, Utah State University

1320 ***Ultra-sensitive and Selective Chip-Based Detection of DNA***
Chad Mirkin, Northwestern University

1140 **Lunch**

1320 ***Surface Templated, Bio-Inspired Synthesis and Fabrication of Functional Materials***
Chad Mirkin, Northwestern University

1400 ***Bio-Inspired Aqueous Lubrication Schemes Probed on the Molecular Level***
Scott Perry, University of Houston

1440 **Break**

1500 ***How to Lubricate with Water: Biomimetic Approaches***
Nicholas Spencer, Swiss Federal Institute of Technology

Tuesday, 4 February 2003

0815	**Opening Remarks – Hugh De Long** Air Force Office of Scientific Research, AFOSR/NL
0830	***Front-End Processing of Cell Lysates for Enhanced Chip-Based Detection and Analysis*** James Schneider, Carnegie Mellon University
0910	***Biologically-Based Nanostructures for Catalysis and Optics*** Morley Stone, Air Force Research Laboratory, AFRL/MLPJE
0950	**Break**
1020	***S-Layer Templated Nanoparticle Arrays and Carbon Nanotubes*** Uwe B. Sleytr, University of Natural Resources and Applied Life Sciences
1100	***Bio-Hybrid Surface Assemblies at Engineering Interfaces: Mechanosensitive Proteins at Silicon Surfaces with Controlled Surface Energy*** Maryna Ornatska and Vladmir Tsukruk, Iowa State University
1140	**Lunch**
	Silk
1320	***Recombinant Engineering and Structural Analysis of Silk Films*** Morley Stone, Air Force Research Laboratory, AFRL/MLPJE
1400	***Structure and Phase Behavior of Fibrous Proteins Related to Materials Engineering*** David Kaplan, Tufts University
1440	**Break**
1500	***Biomimetic Microstructure Formation of High Performance Silk Films and Fibers*** Margaret Roylance, Foster-Miller

Wednesday, 5 February 2003

0815	**Opening Remarks – Hugh De Long** Air Force Office of Scientific Research, AFOSR/NL
0830	***Optical Limiting Silk Membranes*** Ronald Eby, University of Akron
0900	***Designing Spider Silk Genes for Materials Applications*** Randy Lewis and Michael Hinman, University of Wyoming
0950	**Break**
1020	***The Beginning of Silk*** Ann Terry and Fritz Vollrath, Oxford University
1100	***Nanomechanics of Biopolymers*** Kathryn Wahl, Naval Research Laboratory
1140	**Lunch**

Biominerialization

1320	***The Interface Between Biology and Inorganics*** Rajesh Naik, Air Force Research Laboratory, AFRL/MLPJE
1400	***Studies of Biosilicification; The Role of Proteins, Carbohydrates and Model Compounds in Structure Control*** Carole Perry, University of Nottingham-Trent
1440	**Break**
1500	***Chemically-tailored 3-D Nanoparticle Structures by the BaSIC Process*** Ken Sandhage, Ohio State University

Thursday, 6 February 2003

0815	**Opening Remarks – Hugh De Long** Air Force Office of Scientific Research, AFOSR/NL
0830	***Biological Processing of Nanostructured Silica in Diatoms*** Mark Hildebrand, Scripps Institute of Oceanography

Thermal Sensors

0910	***The Creation of a Hybrid Protein/Conductive Polymer Thermosensor*** Morley Stone and Lawrence Brott, Air Force Research Laboratory, AFRL/MLPJ
0950	**Break**
1020	***The Role of Mitochondria in the Sensing and Emission of Cellular Infrared* Signals** Guenter Albrecht-Buehler, Northwestern University
1100	***Toward the Engineering of a Mechanically Activated Nanosensor*** Paul Blount, University of Texas Southwestern Medical Center at Dallas
1140	**Lunch**
1320	***High Resolution Temperature Sensing in Snakes: From Biomimetics To Biosensors*** Massoud Motamedi, University of Texas Medical Branch
1400	***Progress Towards Engineering Protein-Based Thermosensors*** Todd Pappas, University of Texas Medical Branch
1440	**Break**
1500	***Infrared Reception in Pyrophilous Insects*** Horst Bleckmann and Helmut Schmitz, University at Bonn

Friday, 7 February 2003

0815	**Opening Remarks – Hugh De Long,** Air Force Office of Scientific Research, AFOSR/NL
0830	***The Capillary Bed of Boid and Crotaline Pit Organs: Comparison of Morphology and Function*** Richard Goris, Yokohama City University

Chromophores

0910	***Biological Chromophores and Potential DoD Applications*** Morley Stone and Rajesh Naik, Air Force Research Laboratory, AFRL/MLPJE
0950	**Break**
1020	***Photoproteins and Chromophores as Biosensors*** Fredrick Tsuji and Mark Hildebrand, University of California, San Diego
1100	**Wrap-up**

FINAL AGENDA--SOFTWARE & SYSTEMS 2002 ANNUAL MEETING--3-7 JUNE 02

MONDAY --- 3 JUNE 02

0900-1100	**REGISTRATION/DISCUSSION**
1100-1215	**LUNCH**
1215-1230	HERKLOTZ
1230-1300	LYNCH
1300-1345	KNOBLOCK
1345-1415	GIL
1415-1430	**BREAK**
1430-1500	BURGOON
1500-1530	METAXAS
1530-1600	**BREAK**
1600-1630	SHIN
1630-1700	VESTAL
1700-1730	FRANK

TUESDAY --- 4 JUNE 02

0800-0900	**REGISTRATION/DISCUSSION**
0900-0915	HERKLOTZ
0915-0945	HEXMO0R
0945-1015	GAMBLE
1015-1030	**BREAK**
1030-1100	LINDERMAN
1100-1130	SANDERS
1140-1300	**LUNCH**
1300-1330	PERLIS
1330-1400	SANTOS
1400-1415	**BREAK**
1415-1445	TECUCI
1445-1515	SHEN
1515-1530	**BREAK**
1530-1600	SHEN
1600-1630	
1630-1700	

WEDNESDAY ---5 JUNE 02

0800-0900	**REGISTRATION/DISCUSSION**
0900-0915	TANGNEY
0915-0945	WAXMAN
0945-1015	SYCARA
1015-1030	**BREAK**
1030-1100	LLINAS
1100-1130	BHANU
1140-1300	**LUNCH**
1300-1330	MANGASARIAN
1330-1400	CYBENKO
1400-1415	**BREAK**
1415-1445	JACOBS
1445-1515	RODRIGUEZ
1515-1530	**BREAK**
1530-1600	REEVES
1600-1630	
1630-1700	

THURSDAY --- 6 JUNE 02

0800-0830	**REGISTRATION/DISCUSSION**
0830-0845	HERKLOTZ
0845-0915	YE
0915-0945	SCHNEIDER
0945-1015	MORRISETT
1015-1030	**BREAK**
1030-1100	FRIDRICH
1100-1130	MEMON
1140-1300	**LUNCH**
1300-1330	BAZZI/SELCUK
1330-1400	YE
1400-1415	**BREAK**
1415-1445	FREEMAN
1445-1515	VEMURI
1515-1530	**BREAK**
1530-1600	PANDA
1600-1620	KWIAT
1620-1640	POPYACK
1640-1700	JABBOUR
1700-1730	HALPERN

FRIDAY --- 7 JUNE 02

0800-0830	**REGISTRATION/DISCUSSION**
0830-0845	HERKLOTZ
0845-0915	POLLOCK
0915-0945	GUNSCH
0945-1015	LI
1015-1030	**BREAK**
1030-1100	HUMPHREY
1100-1130	
1140-1300	**LUNCH**

Workshop on Nanoscale Approaches to Multifunctional Coatings

Keystone II Workshop

Sunday, 11 August 2002

No-host Reception & Registration

Keystone Lodge Terrace

5:00 to 7:30PM

Agenda

Monday, 12 August 2002
Nanoscience Based Approaches to Materials

7:30-8:30	**Continental Breakfast & Registration**
8:30-8:45	Opening Remarks – Dr. Michael Donley
Session N1	**Dr. Michael Donley, Conference Organizer and Session Chair**
8:45-9:45	Keynote Address – **Using Nanoscience-based Approaches and Concepts to Expand the Range of Coating Functionality** *Dr. Donald R. Baer, Pacific Northwest National Laboratory*
9:45-10:15	**Investigation of Nanostructured Al-based Quasicrystal Thin Films for Corrosion Protection** *Dr. Seva N. Balbyshev, Universal Technology Corp.*
10:15-10:30	**Break**
Session N2	**Dr. Jeffrey Brinker, Session Chair**
10:30-11:15	**Electrochemical Synthesis: A Novel Technique for Processing Multi-Functional Coatings** *Prof. Jude O. Iroh, University of Cincinnati (NRC - AFRL/MLBT)*
11:15-11:45	**Epoxy Layered-Silicate Nanocomposites** *Dr. Chenggang Chen, University of Dayton Research Institute*
11:45-12:15	**Nanoparticle-filled Silane Films as Chromate Replacements for Aluminum Alloys** *Prof. Wim J. van Ooij, University of Cincinnati*
4:30-5:15	**Editor's Room Open**
5:30-6:45	**Dinner** – Crab & Asparagus Bisque, Spinach & Radicchio Salad, Wild Berry Granita, Grilled New York Steak, Chocolate Decadence
Session N3	**Dr. Don Baer, Session Chair**
7:00-7:50	**Opportunities for Nano-structured "Sol-Gel-Derived" Materials in Corrosion Inhibition** *Prof. C. Jeffrey Brinker, University of New Mexico*
7:50-8:20	**The Self-assembled NAno-phase Particle (SNAP) Process: A Nanoscience Approach to Coatings** *Dr. Michael Donley, AFRL/MLBT*
8:20-8:50	**Nanostructured Sol-Gel Approach for Corrosion Protection** *Dr. Natasha Voevodin, University of Dayton Research Institute*
7:00-10:00	**Editor's Room Open**
8:50	**End of Session**
NOTE:	**The Editor's Room will be open during all sessions of the Workshop, in addition to the hours specially annotated.**

Agenda

Tuesday, 13 August 2002
Bio-Inspired Approaches to Coatings/Materials

7:30-8:30	**Continental Breakfast & Registration**
Session B1	**Dr. Hugh De Long, Session Chair**
8:30-8:40	Opening Remarks
8:40-9:40	**Bio-Inspired and Biologically-Derived Materials for Coatings** *Dr. Morley Stone, AFRL/MLPJ*
9:40-10:20	**Biological Processing of Nanostructured Silica in Diatoms** *Dr. Mark Hildebrand, Scripps Institute of Oceanography*
10:20-10:40	**Break**
Session B2	**Dr. Hugh De Long, Session Chair**
10:40-11:30	**Molecular Biomimetics: Genetic Engineering of Proteins for Inorganic Surfaces** *Prof. Mehmet Sarikaya, University of Washington*
11:30-12:10	**Nanoshell-based Particles: Bioinspired Elements for Multifunctional Coatings** *Prof. Naomi Halas, Rice University*
4:30-5:15	**Editor's Room Open**
5:30-6:45	**Dinner** – Roasted Tomato Bisque, Boston Bibb Salad, Blueberry Granita, Breast of Chicken and Crab Stuffed Shrimp, Chocolate Frangipane Pear Tart
Session B3	**Dr. Morley Stone, Session Chair**
7:00-7:40	**Biomolecular Nanotechnology and Biomimetics with 2D-Protein Crystals** *Prof. Uwe Sleytr, Ludwig Boltzmann Institute for Molecular Nanotechnology, University of Agricultural Sciences, Vienna, Austria*
7:40-8:20	**Synthetic and Bio-hybrid Nanoscale Coatings with Tailored Surface Functionalities** *Prof. Vladimir V. Tsukruk, Iowa State University*
7:00-10:00	**Editor's Room Open**
8:20-8:35	**Break**
8:35-9:35	**Poster Session**

NOTE: **The Editor's Room will be open during all sessions of the Workshop, in addition to the hours specially annotated.**

Agenda

Wednesday, 14 August 2002
Nanoscience Approaches to Aircraft Coatings I

7:30-8:30	**Continental Breakfast & Registration**
Session A1	**Dr. Paul Trulove, Session Chair**
8:30-8:40	Opening Remarks
8:40-9:30	**The Development of a Multi-Functional Coating for Aerospace Applications Using Molecular- and Nano-engineering Methods** *Prof. S. Ray Taylor, University of Virginia*
9:30-10:00	**Active Corrosion Protection and Corrosion Sensing in Organic Coatings** *Prof. Rudy G. Buchheit, Ohio State University*
10:00-10:15	**Break**
Session A2	**Prof. Gordon Bierwagen, Session Chair**
10:15-11:00	**Smart Corrosion Inhibiting Coatings** *Dr. Martin Kendig, Rockwell Scientific Company, LLC*
11:00-11:30	**Nanograin Magnetoresistive Manganite Coatings for Signature Reduction and Shielding Against Directed Energy Pulses** *Prof. Chhiu-Tsu Lin, Northern Illinois University*
11:30-12:00	**Dispersion and Film Properties of Multi-Walled Carbon Nanotube Pigmented Conductive Coatings** *Dr. Joel A. Johnson, AFRL/MLBT*
4:30-5:15	**Editor's Room Open**
5:30-6:45	**Dinner** – White Bean Tomato Soup, Smoked Salmon, Pomegranate Granita, Roast Colorado Lamb, Chocolate Crepe al Orange
Session A3	**Prof. Rudy Buchheit, Session Chair**
7:00-7:40	**Nanostructured Sol-Gel Derived Conversion Coatings Based on Epoxy- and Amino-Silanes** *Dr. Alexander Khramov, Universal Technology Corp.*
7:40-8:10	**Surface Analytical Study of Self-Assembled Nano-phase Particle (SNAP) Surface Treatments** *Linda S. Kasten, University of Dayton Research Institute*
8:10-8:40	**Molecular Design of In-situ Phosphatizing Coatings for Aerospace Primers** *Prof. Chhiu-Tsu Lin, Northern Illinois University*
7:00-9:30	**Editor's Room Open**
8:40	**End of Session**
NOTE:	**The Editor's Room will be open during all sessions of the Workshop, in addition to the hours specially annotated.**

Agenda

Thursday, 15 August 2002
The Space Environment and Space Coatings

7:30-8:30 **Continental Breakfast & Registration**

Session S1 **Dr. Joe Osborne, Session Chair**

8:30-8:40 Opening Remarks

8:40-9:30 **Space Environments and Induced Damage Mechanisms in Materials**
Dr. Gary Pippin, The Boeing Company

9:30-10:00 **A Multiple Scattering Model Analysis of ZnO Pigment for Spacecraft Thermal Control Coatings**
Dr. Joel Johnson, AFRL/MLBT

10:00-10:15 **Break**

Session S2 **Dr. Joel Johnson, Session Chair**

10:15-11:05 **Molecular Beam and Scanning Probe Microscopy Studies of Interfacial Reactivity and Collisional Energy Exchange**
Prof. Steven Sibener, University of Chicago

11:05-11:35 **Protective Space Coatings: A Ceramer Approach to Nanoscale Materials**
Prof. Mark Soucek, University of Akron

11:35-12:05 **On-Orbit Testing of Space Environment Interactions With Materials**
Dr. Joseph Osborne, The Boeing Company

4:30-5:15 **Editor's Room Open**

5:30-7:00 **Dinner** – Jumbo Shrimp Cocktail, Five Onion Soup, Passion Fruit Sorbet, Tenderloin of Beef and Spice Rubbed Salmon, Kiwi Wild Berry Mille Feuille

Nanoscience Approaches to Aircraft Coatings II

Session A4 **Dr. Seva Balbyshev, Session Chair**

7:15-7:45 **Use of a Scanning Thermal Microscope to Examine Corrosion Protective Coatings in Exposure**
Prof. Gordon Bierwagen, North Dakota State University

7:45-8:15 **Electrochemical Processing of High Temperature Conducting Polyimide Nanocomposites**
Prof. Jude O. Iroh, University of Cincinnati (NRC – AFRL/MLBT)

8:15-8:45 **Cerium/Water Equilibrium for Precipitation of Cerium Oxide Nanoparticles**
Prof. James Stoffer, University of Missouri – Rolla

7:00-9:30 **Editor's Room Open**
8:45 **End of Session**

Agenda

Friday, 16 August 2002
Modeling Approaches to Coatings/Materials

7:30-8:30 **Continental Breakfast**

Session M1 **Dr. Barry Farmer, Session Chair**

8:30-8:40 Opening Remarks

8:40-9:30 **Advances in the Implementation of a Reliability-based Methodology for Predicting the Service Life of Coating Systems**
Dr. Jonathan Martin, NIST

9:30-10:00 **Multiparameter Models of the Viscoelastic/Plastic Mechanical Properties of Coatings via a Combined Nanoindentation and Non-linear Finite Element Modeling**
Prof. Timothy Ovaert, University of Notre Dame

10:00-10:15 **Break**

Session M2 **Dr. Barry Farmer, Session Chair**

10:15-11:05 **Interface Changes in Electrophoretic Polymer Deposition**
Prof. Ras Pandey, University of Southern Mississippi

11:05-11:35 **Computer Simulation Study of Polyelectrolyte Adsorption and Multi-Layer Formation**
Prof. Arun Yethiraj, University of Wisconsin

11:35-12:05 **Modeling the Nonequilibrium Process in Nano-sized Silane-based Macromolecule Formation in The SNAP Coating Process**
Dr. Seva Balbyshev, Universal Technology Corporation

12:05 End of Conference

AGENDA
Workshop on Energetic Ionic Liquids
9-10 October 2002
Dulles, VA

9 October 2002

8:45 Michael Berman, Air Force Office of Scientific Research
9:00 Greg Drake, Air Force Research Laboratory
9:30 John Wilkes, US Air Force Academy
10:00 Robin Rogers, University of Alabama

10:30 Break

11:00 Alan Katritzky, University of Florida
11:30 Open Discussion – Synthesis and Properties
Participants will be invited to speak for 5-10 minutes with vugraphs to stimulate discussion.

12:15 Lunch

1:30 C. K. Ed Law, Princeton University
2:00 Ed Maginn, University of Notre Dame
2:30 Mark Gordon, Iowa State University
3:00 Open Discussion – Combustion and Modeling
Participants will be invited to speak for 5-10 minutes with vugraphs to stimulate discussion.

3:45 Working Group Sessions

10 October 2002

9:00 Working Group Sessions

10:30 Discussion and recommendations

12:00 Adjourn

ANNUAL REPORT

RESEARCH
EVALUATION MANAGEMENT SERVICES
FOR THE
CHEMISTRY AND LIFE SCIENCES PROGRAM

CONTRACT NO. F49620-00-C-0009

Period of Performance: 3/1/01 – 2/28/02

Prepared For:

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

CHEMISTRY AND LIFE SCIENCES DIRECTORATE

Dr. Genevieve Haddad, Program Manager

Prepared By:

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

RESEARCH EVALUATION MANAGEMENT SERVICES FOR
THE CHEMISTRY AND LIFE SCIENCES PROGRAM

Table of Contents

INTRODUCTION

UES, Inc. is providing research evaluation services to the Directorate of Chemistry and Life Sciences, Air Force Office of Scientific Research (AFOSR), in subareas that include Neurosciences (e.g., Neurochemistry, Biology, Electrophysiology, Neuroanatomy, Multisensory Integration/Spatial Orientation, Cardiovascular Physiology, and Bioenvironmental Hazards; Psychophysics, Psychophysiology, Physiological Psychology, Sensation, Perception, Cognition); Computer Sciences (e.g., Vision and Robotics); Otolaryngology; Meteorology, Chemistry (e.g., computational chemistry, polymeric and organic materials, photonic materials, inorganic and surface chemistry, high density materials); Biotechnology (e.g., materials and processes); and Fuels (e.g., petroleum and synthetic); and in related programs under development.

The services provided by UES, Inc. include: selecting qualified scientists to evaluate proposals, assembling scientific groups to evaluate, analyze and advise on content and direction of Chemistry and Life Sciences Programs; organizing workshops to assist in the definition of new basic research areas proposed by the Chemistry and Life Sciences Directorate; providing advisors to make presentations and assist government personnel with analyzing areas of relevant science; and providing advisors to assist and advise on site visits to research laboratories.

The first option year included: 72 Proposals that were reviewed, 6 Program/Contractor Reviews, 1 Workshop and 1 Panel Meeting.

A. Evaluations of Individual Research Proposals

UES received 72 proposals for review by evaluators during the performance period of
1 March 2001 through 28 February 2002.

UES has been providing the Director of Chemistry and Life Sciences a Summary of Proposals Under Review (SPUR) report on a biweekly basis. This report is now being sent electronically as well as a hard copy. This report is composed of the UES log sheet indicating the proposals sent out, the names of the evaluators to whom the proposals were sent, the dates the proposals were mailed, the tickle date, any necessary comments, and the date the reviews were received. This allows the Program Managers to have a current listing of all proposal activity.

B. Contractor/Program Reviews

1. The first program review was for the **Biomimetics and Biotechnologies** Program Review, Philadelphia Airport Marriott, Philadelphia, PA, 4-6 March 2001. ($6,119.20) This meeting was a combined review and technical exchange involving researchers from all AFOSR biomimetics programs. Specifically, presentations were given for AFOSR internally funded programs, AFOSR externally funded programs, and AFOSR managed MURI/URI programs. The purposes of this meeting was to formally review the technical merit and scientific relevance of current efforts, to discuss opportunities for closer collaborations and scientific exchanges with the

MURI/URI participants and to establish a future direction and priority for this program. UES provided on-site support, printed abstract booklets and coordinated all arrangements for the program review. Speakers: 22, Attendees: 10
Dr. Robert Cohn, Program Manger

2. The second program review was the **Polymer Matrix Composite** Program Review, Hyatt Regency Long Beach, Long Beach, CA, 11-12 May 2001. ($7,805.43) This program addresses the materials science issues relating to developing improved performance or lower cost polymer matrix composite (PMC) systems and to processing and utilizing these structures for AF systems. UES provided on-site support, abstract booklets and made all arrangements for the meeting. Thirty of the 51 attendees were speakers.
Dr. Charles Lee, Program Manager

3. The third program review was **Molecular Dynamics/Theoretical Chemistry (MD/TC)** Contractor's Meeting, The Beckman Center, Irvine, CA, 21-24 May 2001.
($3,449.03) The objectives of the molecular dynamics program are to understand, predict, and control the reactivity and flow of energy in molecules. Twenty-five scientists gave presentations regarding their grant proposals in this area. UES provided on-site support, abstract booklets and made all arrangements for the meeting. There were 77 in attendance including speakers. (25 Speakers and 52 Attendees)
Dr. Michael Berman, Program Manager

4. The fourth program review was **Tribology** Program Review, Hawk's Cay, Duck Key, FL, 4-8 June 2001. ($8,731.68) This meeting was a combined review and technical exchange involving researchers from AFOSR, ONR, and NSF Tribology programs. This program involves the solid, liquid, and vapor states of the tribochemistry program and is designed to provide the Air Force with improved novel lubricants, lubrication systems, and wear-resistant coatings for current-and future-generation aircraft engines.
Speakers: 46
Attendees: 26
Dr. Paul C. Trulove, Program Manager

5. The fifth program review was **Photorefractive Polymer** Program Review, Hilton Gaslamp Quarter, San Diego, CA, 27-28 July 2001. ($4,883.54) The objective of this research is to create new properties through combinations of properties, such as generating photorefractivity through the combination of photoconductivity and electro-optic properties. UES provided on-site support, abstract booklets and made all arrangements for the meeting. There were 10 speakers and 4 attendees. Dr. Charles Lee, Program Manager

6. The Sixth program review was **Tri-Service Corrosion Conference**, La Mansion del Rio, San Antonio, TX, 14-18 January 2002. ($23,152.53) The Tri-Service Corrosion Conference has been hosted biennially by one of the services since being initiated by the Air Force in 1967. The purpose of the Conference is to promote interaction among the military services through a forum wherein the Federal Government's corrosion technologists and interested defense contractors have an open exchange of the latest corrosion

issues relevant to military systems. Moreover, these conferences provide increased visibility of DOD corrosion control and prevention efforts and promote novel and innovative solutions to DOD corrosion problems.

This exchange of information encourages cooperative efforts aiding in the development of integrated corrosion prevention and control technologies. Furthermore, the conferences provide DOD the benefit of feedback, assessments, and recommendations from recognized experts in the corrosion field. The overall goal of these interactions between DOD, private industry, academia, and other Government agencies is to reduce life cycle costs through advances in corrosion control and prevention.

Attendance at the Tri-Service Conference was limited to U.S. Government Employees, DOD Contractors/Grantees, others with approval of service representative. There were 216 in attendance.

C. Workshops

1. **Predictive Toxicology Workshop**, Holiday Inn Fairborn, Dayton, OH, 15-16 May 2001. ($1,179.12) UES made arrangements for meeting room, refreshments and audio-visual equipment. There were 20 attendees at this workshop

D. Panel Meetings

1. **Molecular Dynamics/Theoretical Chemistry Review Panel Meeting**, Marriott Crystal Gateway, Arlington, VA, 22 June 2001. ($691.68) Five panel members reviewed 11 proposals and their evaluations.

E. Advisors

In addition to advisors provided for Program Reviews, Workshops and Panel Meetings, UES provided travel, per diem and in some cases, honorarium for the following advisors:

Paul Blount, Paul Calvert and Steve Clarson, **Biomimetic and Biotechnology Program Review**,
Philadelphia, PA, 4-6 March 2001. ($3,323.79)

Madhu Madhukar, Lee McKague and Norm Johnston, **Polymer Matrix Composite Program Review**, Long Beach, CA, 11-12 May 2001. ($1,876.23)

Allen Tannenbaum, **Predictive Toxicology Workshop**, Dayton, Oh, 15 May 2001. ($326.10)

Manuel Martinez-Sha, **Molecular Dynamics Contractor's Review**, Irvine, CA, 21-23 May 2001. ($1,104.14)

Steven Patton, Hugh De Long, Jorn Larsen-Basse, Kathryn Wahl and Andrey Voevodin, **AFOSR/ONR/NSF Tribology Program Review**, Duck Key, FL, 4-8 June 2001. ($6,802.63)

James Coe, Bruce Garrett, James Muckerman, Mitchio Okumura and Arthur Suits, **Molecular Dynamics/Theoretical Chemistry Panel,** Arlington, VA, 22 June 2001. ($5,059.14)

Joe Hager, **Edwards AFB, CA**, 25-27 June 2001. ($1,114.49)

Jeffery Fisher, Gerldine Grant, Shawna Jackman and Errol Zeiger, **JP-8 Jet Fuel,** Brooks AFB, TX, 7-10 August 2001. ($6,279.75)

Robert Steinman, **Cognitive Engineer.** – Advise AFOSR/NL about Cognitive Science and Cognitive Engineering Systems Sciences in Europe, 12 October – 19 November 2001. ($10,000.00)

Randall Engle, **University of Pennsylvania**, PA, 10-11 October 2001.

John Flach and Thomas Moore, **Brooks AFB, TX**, 20 November 2001. ($1,976.77)

David Carroll, **Materials Research Society and Nanocomposite Kick-Off Meeting at MIT**, Boston, MA, 26-30 November 2001. ($1,795.80)

Paras Prasad, **AFRL Workshop on Polymer Photonics**, Dayton, OH, 5-6 December 2001. ($972.76)

F. Management of the Proposal Evaluation Process

1. UES has complied with Part III, Para.2.3.7.2 of the contract by providing a complete Database of Reviewers (including reviewers used and suggested reviewers), their contact information, titles of proposals reviewed, and program manager. This information is available on our secured Peer Review Web Site (http://peer.ues.com:81). To provide this information in a printed/bound format required three separate documents entitled:

    1) Reviewers Addresses

    2) Recommended Reviewers with Contact Information

    3) Reviewer List with Proposal Titles

SUMMARY

UES is pleased to continue to perform the specific tasks assigned to them in accordance with provisions of the contract. Participants will continue to be Dr. Mike Livingston as Program Manager, Judith M. Flory, Program Administrative Manager and Ann Corbitt as Program Assistant. UES personnel appreciate the opportunity to be of service to AFOSR in this interesting and worthwhile program.

LIST OF APPENDICES

BREAKDOWN OF RESEARCH PROPOSALS BY PROGRAM MANAGER

PROGRAM MANAGER	NO. OF PROPOSALS
Berman	11
Cohn	0
Kozumbo	11
Larkin	13
Lee	14
Tangney	8
Trulove	15

2001 AFOSR Biomimetics & Biotechnologies Program Review
Philadelphia Airport Marriott
Philadelphia, PA
4-6 March 2001

Sunday, 4 March 2001

4:30pm - 6:30pm **Meeting Registration**

6:30pm - 8:30pm **Social & Poster Session**

Inkjet Printing of Biological and Biomimetic Materials
P. Calvert, Materials Science and Engineering, University of Arizona, Tucson, AZ

Advances in the Knowledge of Structure and Function in Snake Infrared Receptors
R. Goris, R. Kishida, M. Nakano, Y. Atobe, T. Hisajima, Yokohama City University School of Medicine, Yokohama, Japan

Engineering Altered Receptor Properties into a Heat Sensing Protein
T. Pappas, *B. Christinsen, M. Motamedi, Center for Biomedical Engineering, *Department of Physiology and Biophysics, University of Texas Medical Branch, Galveston, TX

Structure and Function of VR1: A Thermal Receptor Activated by a Capsaicin
V. Moisennkova, B. Bell, M. Motamedi, B. Christensen, Center for Bioengineering, Department of Physiology and Biophysics, University of Texas Medical Branch, Galveston, TX

Bloodsucking Bugs as Biosensors for Tracking People Buried Alive – A Concept
S. Trenner, H. Bleckmann, H. Schmitz, University of Bonn, Institute for Zoology, Bonn, Germany

A New Type of Infrared Receptor in the Australian "Fire-Beetle" Merimna atrata (Coleoptera, Buprestidae)
H. Schmitz, A. Schmitz, H. Bleckmann, University of Bonn, Institute for Zoology, Bonn, Germany

Monday, 5 March 2001

7:30am *Continental Breakfast*

8:00am **Welcome & Admin Details**

8:15am **Program Overview**
R. Cohn, Air Force Office of Scientific Research, Arlington, VA

Monday, 5 March 2001 (Continued)

8:30am **STTR Overview**
J. Evers, Air Force Research Laboratory, Eglin AFB, FL

9:15am **MURI Overview**
A. J. Welch, University of Texas, Austin, TX

10:00am *Break*

10:15am **Infrared Sensory Systems in Pyrophilous Beetles**
H. Schmitz, University of Bonn, Bonn, Germany

10:45am **The Role of Capillary Bloodflow in Regulating Afterimage in Pit Vipers**
R. Goris, Yokohama City University School of Medicine, Yokohoma, Japan

11:15am **Reversible, Excitation Light-Induced, Enhancement of Fluorescence (RELIEF)**
G. Albrecht-Buehler, Northwestern University Medical School, Chicago, IL

11:50am *Lunch (Social)*

1:00pm **Integration and Advances in Biomimetics**
L. Brott, S. Kirkpatrick, R. Naik, M. Stone, Air Force Research Laboratory, Wright-Patterson AFB, OH

2:30pm *Break*

2:45pm **Luminescence, Fluorescence, and Energy Conversion in Photoproteins –**
A New Example in the Brittlestar, *Ophiopsila californica*
D. Deheyn, M. Hildebrand, F. Tsuji, Scripps Institution of Oceanography,
University of California at San Diego, La Jolla, CA

3:15pm **Inspiration from Nature: The Control and Synthesis of the Silicified Cell Wall in Diatoms**
M. Hildebrand, Scripps Institution of Oceanography, University of California
at San Diego, La Jolla, CA

3:45pm *Break*

4:00pm **Cooperative Control**
R. Wehling, AFRL/MN, Eglin AFB, FL

4:20pm **Biomaterials**
M. Stone, AFRL/MLPJ, Wright-Patterson AFB, OH

Monday, 5 March 2001 (Continued)

4:40pm **Bioelectronics**
M. Wilcox, U. S. Air Force Academy, USAF Academy, CO

5:10pm **Program Summary**
R. Cohn, Air Force Office of Scientific Research, Arlington, VA

6:15pm *Dinner (Social)*

Tuesday, 6 March 2001

7:30am *Continental Breakfast*

8:00am **MURI Project Overview**
A. J. Welch, University of Texas, Austin, TX

8:20am **MURI: Biological Detection Systems for Electromagnetic Spectral Signatures**
M. Motamedi, B. Christensen, The University of Texas Medical Branch, Galveston, TX

8:40am **Exploration of Transduction Mechanism in the Infrared-Sensitive Pit Organ of *Melanophila acuminata***
D. Hammer, University of Texas, Austin, TX

9:00am *Break*

9:20am **Numerical Models of Pit Viper IR Sense Organ**
J. Pearce, The University of Texas, Austin, TX

9:40am **Project Goals and Overview**
H. Bayley, The Texas A&M University Systems Health Science Center, College Station, TX

10:00am **Microprobing Biological IR Receptors: Materials Approach**
V. Tsukruk, Iowa State University, Ames, IA

10:20am *Break*

10:40am **Infrared Wavelength – Selective Microbolometers**
S-J. Yoo, D. Hammer, A. J. Welch, D. Niekirk, The University of Texas, Austin, TX

11:00am **Biological Detection Systems for Electromagnetic Spectral Signatures**
J. McDevitt, University of Texas, Austin, TX

11:20am **Biological Detection Systems for Electromagnetic Spectral Signatures**
A. J. Welch, The University of Texas, Austin, TX

11:45am *Lunch (Working) / Discussion Groups*

2:00pm Discussion Groups Summaries

2:30pm **Wrap-Up**
R. Cohn, Air Force Office of Scientific Research, Arlington, VA

2:55pm *Adjourn*

AGENDA
AFOSR Polymer Matrix Composite Program Review
11-12 May 2001

Hyatt Regency
Long Beach, CA

Friday, 11 May 2001

7:30 Registration/Continental Breakfast

8:00 Opening Remarks – *Charles Lee, AFOSR/NL, Arlington, VA*

8:10 Developments in Dielectric Techniques for Non-Destructive Examination
William Banks, David Hayward, Richard Pethrick, University of Strathclyde, Scotland,UK; Robert Crane, Wright Patterson Laboratory, Wright-Patterson AFB, OH

8:40 Local Dynamics of Adhesive Joints by Dielectric Relaxation Spectroscopy
Jovan Mijovic, Polytechnic University, Brooklyn, NY

9:25 Laboratory for Research on Electron Beam Curing of Composites: A Review of Current Research and Capabilities
Don Klosterman, University of Dayton, Dayton, OH

9:40 Liquid Crystal Adhesives
Patrick Hood, Cornerstone Research Group, Inc., Dayton, OH;
Richard Chartoff, University of Dayton, Dayton, OH

10:25 Break

10:45 The Structure - Property Relations and Durability of Polymers and Their Composites for Future Air Force Applications
Roger J. Morgan, Texas A&M University, College Station, TX

11:30 High Temperature Polymer Matrix Composites Performance Characterization in Aerospace Environments
E. Eugene Shin[1], Roger J. Morgan[2], James K. Sutter[3], and Mary Ann Meador[3]
[1]OAI-NASA Glenn Research Center, Cleveland, OH
[2]Texas A&M University, College Station, TX
[3]NASA Glen Research Center, Cleveland, OH

12:00 Interphase Engineering in Carbon Fiber/BMI Composites to Improve Fiber-Matrix Adhesion and Composite Shear Strength
Lawrence T. Drzal, Michigan State University, East Lansing, MI;
Donghwan Cho, Kumoh National University of Technology, Korea

Friday, 11 May 2001 (Cont'd)

12:30 Lunch

13:30 Durability Characterization of High Temperature Polymer Matrix Composites for
Air Force Applications: Structure-Property Relationships;
Development of Low Cure Shrinkage Adhesives for Structural Applications
Chuk Leung, PolyComp Technologies, Inc., Del Mar, CA

14:00 Residual Stresses in Thermosets: Modeling and Long Term Performance
Mataz Alcoutlabi, Sindee L. Simon, Gregory B. McKenna, Texas Tech University,
Lubbock, TX

14:30 Polymer Volume Change, Fiber Stress, and Stress Relaxation During a Cure Cycle
Madhu S. Madhukar, The University of Tennessee, Knoxville, TN

15:00 Cryogenic Cycling Behavior of Polymeric Composite Materials: Matrix and Fiber
Influences on Microcracking
James C. Seferis, University of Washington, Seattle, WA

15:30 Break

15:45 Environmental Durability of High Performance Polymer Matrix Composites
David Curliss, AFRL/MLBC, Air Force Research Laboratory, Wright-Patterson AFB, OH

16:15 Innovative Manufacturing and Structural Analysis of Composite Isogrid Structures for Space Applications, Phase I: Structure-Property Relationships of Organically Modified Layered Silicate/Thermoset Nanocomposites
Derrick Dean, Tuskegee University, Tuskegee, AL

16:45 Next Generation Aerospace Composites Through Nanotechnology
D. Raghavan, Howard University, Washington, DC

17:15 Phenolic-Clay Nanocomposites for Rocket Nozzles
J. H. Koo[1], H. Stretz[1], A. Bray[2], W. Wootan[1], S. Mulich[1], B. Powell[3], and J. Weispfenning[4]
[1]Southwest Texas State University, San Marcos, TX
[2]Systems and Materials Research Consultancy, Austin, TX
[3]Southern Clay Products, Gonzales, TX
[4]Cytec Fiberite, Winona, MN

17:45 End

Saturday, 12 May 2001

7:30 Continental Breakfast

8:00 Development of Low Viscosity High Temperature Polyimide Adhesives
Hongbo Liu, *Daniel A. Scola, University of Connecticut, Storrs, CT*

8:30 Thermosetting Polyarylene Resins for High-Temperature Structural Composite Applications
Farshad Joseph Motamedi, Maxdem, Inc., San Dimas, CA

9:00 Organic Matrix Nanocomposites of Vapor Grown Carbon Fibers (VGCF) and Polyhedral Oligomeric Silsesquioxanes (POSS)
Charles U. Pittman, Jr., Mississippi State University, Mississippi State, MS

9:30 Space-Ready Polymer Nanocomposites
D. Gerald Glasgow, Elliot B. Kennel, Applied Sciences, Inc., Cedarville, OH

10:00 Break

10:15 Structural Foams of Improved Strength and Thermal Stability from Random-Coil
and Rigid-Rod Polymers
Seng Tan, Wright Materials Research Company, Dayton, OH;
James Mark, University of Cincinnati, Cincinnati, OH

10:45 Review of Research in the Year 2000 at PVAMU FAST Center
Paul O. Biney, Prairie View A&M University, Prairie View, TX

11:15 Novel Surface Treatments for Glass Fillers
David A. Boyles, Jon J. Kellar, William M. Cross, South Dakota School of Mines
& Technology, Rapid City, SD

11:45 Novel Multifunctional Space Durable Fluoropolymers and Composites
Huaibing Liu, Allan Shepp, Bob Mojazza, Triton Systems, Inc., Chelmsford, MA;
Dennis Smith, Clemson University, Clemson, SC

12:15 Investigation of Adhesive Joints for Nano-Engineering and Modeling
Chris H. Jenkins, Robb M. Winter, South Dakota School of Mines & Technology,
Rapid City, SD

12:45 End

2001 AFOSR Molecular Dynamics
Contractor's Review
Beckman Center
Irvine, CA
21 – 23 May 2001
Sunday, 20 May 2001

5:00-7:00 PM Registration at the Four Seasons Hotel

Monday, 21 May 2001

8:00 AM **Registration and Breakfast Buffet**

Session Chair: Michael Berman, AFOSR/NL

9:00 Using Cavity Ring-Down to Probe the Spectroscopy and Reaction Dynamics of Ions and Radicals
R. Zare, J. Flad, Y. Rhee and M. Gupta
Stanford University, Stanford, CA

9:30 Molecular Dynamics on Multiple Electronic States: The K + CH3I? KI + CH3 Reaction Cross Section and Its Energy and Orientation Dependence. A Case Study of an Intermolecular Electron Transfer
R. Levine, Hebrew University of Jerusalem, Jerusalem, Israel

10:00 Ion Molecule Chemistry at High Temperature and Pressure
A. Viggiano, S. Arnold, S. Williams, A. Midey, J. Seeley and I. Dotan
Air Force Research Laboratory, Hanscom AFB, MA

10:30 **Break**

Session Chair: Patrick Carrick, SAF/AQRT

11:00 Photoelectron Spectroscopy of Si_nC_m anions
G. Davico, University of Idaho, Moscow, ID
T. Ramond and W. Lineberger, University of Colorado, Boulder, CO

11:30 Polynitrogen Chemistry and the Pursuit of New High Energy Density Materials
K. Christe, W. W. Wilson, A. Vij, V. Vij, J. Sheehy, J. Boatz,
S. Schneider, T. Schroer, R. Wagner, N. Maggiarosa, and R. Haiges
ERC and PRSP/Air Force Research Laboratory, Edwards AFB, CA
Loker Research Institute, University Southern California, Los Angeles, CA

12:00 Ab Initio DFT
R. Bartlett, S. Hirata, I. Grabowski and S. Ivanov
University of Florida, Gainesville, FL

12:30 PM Lunch Buffet

Monday, 21 May 2001 – Continued

Session Chair: Edmond Murad, AFRL/VSBX

2:00 Advances in Satellite Drag Modeling
F. Marcos, Air Force Research Laboratory, Hanscom AFB, MA

2:30 Cluster Deposition Studies of Impact Dynamics and Catalysis Chemistry
M. Aizawa, S. Lee and S. Anderson
University of Utah, Salt Lake City, UT

3:00 **Break**

3:30 Program Status
M. R. Berman, Air Force Office of Scientific Research, Arlington, VA

4:00 Discussion Session: "*Electric Propulsion*"
Discussion Leader: R. A. Dressler

7:30 PM Poster Session and Reception
Four Seasons Hotel

Tuesday, 22 May 2001

8:00 AM **Registration and Breakfast Buffet**

Session Chair: Susan Arnold, AFRL/VSBP

9:00 Gas Phase Ion Chemistry Relevant to Hypersonic Vehicle Applications
S. Williams, Air Force Research Laboratory, Hanscom AFB, MA

9:30 Anisotropic Impurity-Matrix Interactions Can Be Important in Low Temperature High Energy Density Matter
G. Voth, University of Utah, Salt Lake City, UT

10:00 Experimental and Theoretical Study of the Interaction of Aluminum Atoms with Molecular Hydrogen
P. Dagdigian[1], M. Alexander[2], X. Tan[1], J. Williams[2] and J. Krumrine[2]
[1]The Johns Hopkins University, Baltimore, MD
[2]The University of Maryland, College Park, MD

10:30 **Break**

Tuesday, 22 May 2001 – Continued

Session Chair: Mario Fajardo, AFRL/PRSP

11:00 Stabilizing Metastable Species in Liquid Helium Droplets: The Road to High Energy Radical Nanoclusters
R. Miller, University of North Carolina, Chapel Hill, NC

11:30 Spectroscopy, Energetics and Dynamics of Intrinsic Electronic Excitations in Bulk Superfluid ^{4}He
J. Eloranta[1], V. Ghazarian[1], M. Peterson[2], A. Benderskii[3], A. Vilesov[4] and V. Apkarian[1], [1]University of California, Irvine, CA
[2]University of Helsinki, Finland, [3]University of Columbia, New York, NY
[4]University of Southern California, Los Angeles, CA

12:00 Relaxation Dynamics in Quantum Clusters: Lessons Learned and Challenges Ahead
K. Lehmann, Princeton University, Princeton, NJ

12:30 PM **Lunch Buffet**

Session Chair: Ingrid Wysong, AFRL/PRSA

2:00 The Development and Applications of Hybrid Organic/Inorganic Polymers Using Polyhedral Oligomeric Silsesquioxanes (POSS)
S. Phillips, T. Haddad, R. Blanski, F. Feher, B. Viers, R. Gonzalez and S. Svejda
Air Force Research Laboratory, Edwards AFB, CA

2:30 Polyhedral Oligomeric Silsesquioxanes (POSS): Structure, Properties and Mechanisms of Formation
M. Gordon and B. Tejerina, Iowa State University, Ames, IA
T. Kudo, Gunma University, Kiryu, Japan

3:00 **Break**

3:30 Structures and Conformations of POSS Monomers
J. Gidden, P. Kemper and M. Bowers
University of California, Santa Barbara, CA

4:00 Nuclear Quantum Effects in Hydrogen Transfer Reactions for the Synthesis of Polyhedral Oligomeric Silsesquioxanes
S. Hammes-Schiffer, Pennsylvania State University, University Park, PA

Wednesday, 23 May 2001

8:00 AM **Registration and Breakfast Buffet**

Session Chair: Steven Lipson, AFRL/VSBT

9:00 Measurement of Rocket Combustion Emissions and Plume Wake Composition in the Stratosphere
M. Ross, The Aerospace Corporation, Los Angeles, CA

9:30 The Reaction Probability of OH and HO_2 on Soot Particles
M. Molina, Massachusetts Institute of Technology, Cambridge, MA

10:00 Collisions of O Atoms with NO, CO_2, and Hydrocarbons: Atmospheric Implications
J. Dodd, S. Miller, R. Sharma, K. Castle and S. Lipson
Air Force Research Laboratory, Hanscom AFB, MA
E. Hwang and J. Lipson, Stewart Radiance Laboratory, Bedford, MA

10:30 **Break**

Session Chair: Jeffrey Sheehy, AFRL/PRSP

11:00 Collision-Induced Chemical Processes on a Chlorinated Silicon Surface
T. Minton and J. Zhang, Montana State University, Bozeman, MT

11:30 The Kinetics of Adsorbate Islands on Normal and Strained Surfaces: Molecular Adsorption, and Island Evaporation, Diffusion and Coarsening
H. Metiu, University of California, Santa Barbara, CA

12:00 Degradation of Metal Surfaces: The Chemistry and Physics of Microscopic Stress Fields
A. Rappe, University of Pennsylvania, Philadelphia, PA

12:30 PM Closing Remarks, Adjourn

2001 AFOSR/ONR/NSF Tribology Review
Hawk's Cay Resort
Duck Key, FL
4 – 8 June 2001

Monday, 4 June 2001

0730 – 0800 Registration/Continental Breakfast

0800 – 0830 Carbon Nanotube Probes: Enabling Fundamental Research and New Technologies at the Nanoscale
Charles Lieber, Havard University

0830 – 0900 Dynamic Mechanical Properties at the Nanoscale
Kathryn J. Wahl, S. A. Syed Asif and Richard J. Colton
Naval Research Laboratory

0900 – 0930 Dynamic Processes During Tribological Loading of Solid Surfaces
Razil Hariadi, Ryan Leach, Forrest Stevens, Steve Langford, Joe Wasem and
Tom Dickinson, Washington State University

0930 – 1000 Break

1000 – 1030 Electrostatic Monitoring of Boundary and Mixed Lubrication
Robert J. K. Wood, T. J. Harvey and S. Morris, University of Southampton
Honor E. Powrie, Stewart Hughes Limited

1030 – 1100 An Integrated Study of the Lubrication and Failure Transitions in Conformal Contacts
Jane Wang, Northwestern University

1100 – 1130 Superconductivity-Dependent Friction
Alex C. Mayer, Lucas K. Wagner and Jacqueline Krim
North Carolina State University

1130 – 1300 Lunch

1300 – 1330 Quasicrystalline Coatings for Aerospace Applications
Larry Fahrenbacher, Technology Assessment & Transfer, Inc.

1330 – 1400 Nucleation and Growth of Quasicrystalline Thin Films
Laurence D. Marks, Edy J. Widjaja and Christopher S. Own
Northwestern University

1400 – 1430 Tribological Properties of Quasicrystals and Quasicrystal Approximants
Andrew J. Gellman and Chris Mancinelli, Carnegie Mellon University

1430 – 1500 Confirmation of Phase Transformations in Al-Cu-Fe-Cr Thin Films
Dan Shechtman[1, 2] and Alan Duckham[2]
[1]Technion, [2]National Institute of Standards and Technology

Tuesday, 5 June 2001

0730 – 8000 Continental Breakfast/Registration

0800 – 0830 Studies of Micro-Structured Fluids under Confinement and Shear
Cyrus Safinya, Yuval Golan, Youli Li and Jacob Israelachvili
University of California

0830 – 0900 Hydrodynamic Interactions between Rough Surfaces
Richard F. Salant and Dawei Shen, Georgia Institute of Technology

0900 – 0930 Dynamic Shearing Resistance of Confined Molten Metal Films at Extremely
High Strain Rates
Makoto Okada, Nai-Shang Liou, and Vikas Prakash
Case Western Reserve University

0930 –1000 Break

1000 – 1030 Physical Chemistry of Inert Surfaces
Michael Grunze, Angewandte Physikalische Chemie

1030 – 1100 Modeling Dynamic Friction at the Grain Level Including Stochastic Effects
P. Zavattieri, Francois Barthelat and Horacio D. Espinosa
Northwestern University

1100 – 1130 Boundary Lubrication Modeling with Additive Physiochemical Protection
Liming Chang, Penn State University

1130 – 1200 Poster Summaries (2 min per poster)

1200 – 1930 Open Afternoon

1930 2130 Poster Session/Mixer

Adaptive Nanocomposite Coatings Made of Yttria Stabilized Zirconia and Gold
Andrey A. Voevodin, J. J. Hu, T. A. Fritz and Jeffrey S. Zabinski, Air Force Research Laboratory

MD Simulations of the Friction and Wear of Amorphous Carbon Coatings
Guangtu Gao and Judith A. Harrison, United States Naval Academy

High Temperature Tribometry of Pressureless Sintered SiC in Vacuum and Low Pressure
Oxygen Environments
Kurt S. Ketola and Michael N. Gardos, Raytheon Electronic Systems

Spectroscopic and Computational Characterization of Transition Metal Carbide Surface

Chemistry
Peter Frantz and Stephen V. Didziulis, The Aerospace Corporation

Tuesday, 5 June 2001 – Continued

Vacuum Tribology Studies of WC-Ag and TiC-Ag Composite Coatings Deposited by Sputtering and Laser Ablation
Jose Endrino and James E. Krzanowski, University of New Hampshire
Jose J. Nainaparampril, Systran

Time and Length Scaling in Tribological Processes
Jacob Israelachvili, Delphine Gourdon and Carlos Drummond, University of California

Simulating Thermal-Tribological Contacts
Jane Wang, Northwestern University

Mechanical Behavior of Confined Films: An in-situ study of Silane Monolayers by Second
Harmonic Generation (SHG)
Michael Grunze, M. T. Strobel, J. Blümmel, W. Eck, Manfred Buck, University of Heidelberg

Dynamic Friction Measurements at Sliding Velocities Representative of High-Speed Machining Processes
Francois Barthelat, A. J. Patanella and Horacio D. Espinosa, Northwestern University

Chemical-Vibro-Mechanical Polishing of Machine Components
Liming Chang, Penn State University

Kinetics and Energetics of the Desorption of Polyether Lubricants
Andrew J. Gellman, Kris R. Paserva and Nithya Prashanth, Carnegie Mellon University

Scanning Capacitance Microscopy for Thin Lubricant Film Measurements
David T. Lee, Jonathan Pelz and Bharat Bhushan, Ohio State University

TBD, *Steven Danyluk, Georgia Institute of Technology*

TBD, *Lynden A. Archer, Cornell University*

Tribological and Mechanical Characterization of Chemical Mechanical Planarization Process
Ashok Kumar, Arun K. Sikder, Frank Giglio, J. Wood and John M. Anthony
University of South Florida

On Establishing Factor Significance on the Delamination Fracture Toughness of a Composite Laminate
Assimina Pelegri and Anand Tekkam, Rutgers

Thermomechanical Contact and Wear of Rough Surfaces in Sliding Contact
Andres Soom, SUNY at Buffalo

Effect of Accelerated Aging Protocol on the Oxidation and Resultant Wear Behavior of Irradiated Polymers
Thierry A. Blanchet, Rensselaer Polytechnic Institute

Wednesday, 6 June 2001

0730 – 8000 Continental Breakfast/Registration

0800 – 0830 Chemistry, Structure, and Tribological Properties of Nanostructured Lubricant Coatings for Extreme Environments
Jeffrey S. Zabinski, Andey A. Voevodin, J.J. Hu, J. E. Bultman and H. Argadine
Air Force Research Laboratory

0830 – 0900 Micro/Nanotribology of MEMS Materials and Devices: Lubrication Schemes and Environmental Effects
Steve T. Patton, K.C. Eapen and Jeffrey S. Zabinski
Air Force Research Laboratory

0900 – 0930 Correlation of Tribological and Surface Chemical Properties of Metal Carbides
Scott S. Perry, Byung-Il Kim, Rebecca L. Guenard, Luis C. Fernandez Torres,
Xingju Yang and Shuang Li, University of Houston

0930 – 1000 Break

1000 – 1030 High Hardness, Low Friction Carbide-Based Nanocomposite Coatings for
Air and Vacuum Environments
James E. Krzanowski, Todd S. Gross, Carmela Amato-Wierda and Olof Echt
University of New Hampshire
Jose J. Nainaparampril, Systan

1030 – 1100 High Temperature Tribometry of Pressure-Assisted Densified SiC in Vacuum and Low Pressure Oxygen Environments
Kurt S. Ketola and Michael N. Gardos, Raytheon Electronic Systems

1100 – 1130 Synthesis and Characterization of Fatigue-Resistant TiN/SiN_x Nanolayered
Coatings with Enhanced Microstructure
Yu-Hsia Chen, Yip-Wah Chung and Leon Keer, Northwestern University

1130 – 1300 Lunch

1300 – 1330 Effect of Surface Stiffness on the Friction of Sliding Hydroxylkated Alumina Surfaces
Bill Hase, Wayne State University

1330 – 1400 Reaction of Aromatic Phosphate Esters with Iron and Iron Oxides
Nelson Forster, Propulsion and Power
Costandy Saba, University of Dayton Research Institute

1400 – 1430 Mechanistic Surface Chemistry of Vapor Phase Lubrication
Andrew J. Gellman, Daxing Ren and Doug Sung, Carnegie Mellon University

1430 – 1500 QCM-STM Studies of the Nanoscale Dynamics of TCP and other Vapor-Phase
Lubricants on Metals
M. Abdelmaksoud, B. Borovsky and J. Krim, North Carolina State University

Thursday, 7 June 2001

0730 – 8000 Continental Breakfast/Registration

0800 – 0830 Prediction Mechanical Properties of Poly- and Nanocrystalline Microstructures
from the Atoms to the Macroscale
Donald W. Brenner and Olga Shenderova, North Carolina State University
Airat Nazarov, Russian Academy of Sciences

0830 – 0900 Structure, Forces and Rheology in Nanoscale Devices
Uzi Landman, Georgia Institute of Technology

0900 – 0930 Surface Reconstruction of Alumina Surfaces
J. W. Mintmire, U. S. Naval Research Laboratory

0930 – 1000 Break

1000 – 1030 MD Simulations of the Friction of n-Alkane Monolayers
Judith Harrison and Paul T. Mikulski, U. S. Naval Academy

1030 – 1100 Mathematical Modeling of Stress-Induced Lubricant Degradation
Ilya I. Kudish, Kettering University

1100 – 1130 Powder Lubrication Modeling
Mike Khonsari, Louisiana State University

1130 – 1300 Lunch

1300 – 1330 Hyper-Spectral Chemical Imaging hardware and Software: Theory and Applications

Dor Ben-Amotz, Karim Jallad and Dongmao Zhang, Purdue University

1330 – 1400 Non-vibrating Contact Potential Difference Sensors for Condition-based Maintenance
Steven Danyluk, Georgia Institute of Technology

1400 – 1430 Thermoelastic Instability of an Automotive Disk Brake --- Numerical Predictions and Experiments
Yun-Bo Yi and James R. Barber, University of Michigan

1430 – 1500 TBD

Friday, 8 June 2001

0730 – 8000 Continental Breakfast/Registration

0800 – 0830 Friction and the Continuum Limit –Where is the Boundary?
Steve Granick, University of Illinois

0830 – 0900 Nano-Scale Self-Assembled Coatings
Carolyn Aita, University of Wisconsin

0900 – 0930 *In situ* Raman Tribometry for Condition-based Monitoring of DLC Coated Bearings
Thomas W. Scharf and Irwin L. Singer, U. S. Naval Research Laboratory

0930 – 1000 **Break**

1000 – 1030 TBD, *Juergen Kreuzer, Dalhousie University*

1030 – 1100 A Novel Technology to Synthesize Nano-composite: Solid Lubricant and Hard Material Composite Coating, A Case Study
S. N. Yedave, Ajay P. Malshe and W. D. Brown, University of Arkansas

AFOSR Photorefractive Polymer Program Review
Hilton Gaslamp Quarter
San Diego, CA
27-28 July 2001

Friday, 27 July 2001 (Marina Room)

0730 – 0800 **Registration/Continental Breakfast**

0800 – 0820 Welcome/ Directions and Initiatives
Charles Lee, AFOSR, Arlington, VA

0820 – 0840 Signal Processing
Chuck Woods

0840 – 0900 Dynamic Hologram
Fassil Ghebremichael

0900 – 0945 AFOSR/MLPJ Initiative on Photorefractive Fibers
T.J. Bunning and S. Guha, AFRL/MLPJ

0945 – 1005 **Break**

1005 – 1050 AFRL/MLPJ In-house Photorefractive Effort
Dean Evens, TMCI/MLPJ

1050 – 1135 Developing Photorefractive Glass Composites
Jason P. Duignan, Lesley L. Taylor & Gary Cook*
Defence Evaluation Research Agency, Malvern, U.K.

1135 – 1220 Transversely Excited Liquid Crystal Cells
Gary Cook, Jason P. Duignan, Lesley L. Taylor
Defence Evaluation Research Agency, Malvern, U.K.

1220 – 1320 **Lunch**

1320 – 1405 A Comparison of Point Defects in Undoped Congruent, Iron-Doped Congruent,
and Undoped Stoichiometric LiNbO3 Crystals
Larry Halliburton, West Virginia University

1405 – 1450 Photorefractive Polymer Fibers
Mark G. Kuzyk, Washington State University

1450 – 1510 **Break**

1510 – 1555 Control of Stoichiometry of LiNbO3 Fibers prepared by Laser Heated Pedestal
Growth and Spectroscopy of Fe2+/Fe3+
Richard S. Meltzer, Uwe Happek, Sergei A. Basun and Michele Tavernese
University of Georgia

1555 – 1625 Image Processing using Photorefractive Polymers
Partha P. Banerjee, University of Dayton

1625 – 1655 Optical Pulsator with Multi-Channel Output
N. Kukhtarev, T. Kukhtareva, Alabama A & M University

Saturday, 28 July 2001

0730 – 8000 **Continental Breakfast**

0800 – 0845 Mechanisms of Photorefractivity in Polymeric Materials
Ulrich Gubler, Daniel Wright, and W.E. Moerner, Stanford University
Meng He and Robert Twieg, Kent State University

0845 – 0930 Photon-gated Photorefractive polymers
N. Peyghambarian and B. Kippelen, University of Arizona

0930 – 1015 Photorefractivity, Photoconductivity, and Charge Transport in Novel Inorganic
Quantum Dot: Polymer Nanocomposites
Paras Prasad, State University of New York at Buffalo

1015 –1035 **Break**

1035 – 1120 Functionalized Simple Organic Photorefractive Materials
Luping Yu, University of Chicago

1120 – 1205 Nanostructured Liquid Crystalline Photorefractive and Semiconducting Materials
K.D. Singer, I. Shiyanovskaya, Case Western Reserve University
V. Percec, M. Obata, Y. Miura, University of Pennsylvania

1205 – 1250 Liquid Crystal Semiconductors
R. Twieg, V. Gettwert, L. Semyonov, L. Sukhomlinova, Kent State University
K. Singer, I. Shiyanovskaya, Case Western Reserve University

1250 – **Lunch**

Tri-Service Corrosion Conference
14-18 January 2002

La Mansion del Rio Hotel
San Antonio, TX

Monday, 14 January 2002

1000-1200 Registration Desk Open

1400 **Lt.Col. Paul Trulove,** Program Manager,
Air Force Office of Scientific Research, Arlington, VA

1415 **Col. Michael R. Carpenter,** Chief,
Planning Division of Aging Aircraft Systems Program Office,
Wright-Patterson AFB, OH

1505 **MG James R. Snider,** Deputy Chief of Staff for Research,
Development and Acquisition,
Headquarters U. S. Army Materiel Command, Alexandria, VA

1555 **Capt. Jerome L. Budnick**, Head of the Air Vehicle Department,
Naval Air Systems Command, Patuxent River, MD

1645 **Meeting Organization, Maj. Robert A. Mantz,** Research Chemist,
Air Force Research Laboratory, Wright-Patterson AFB, OH

1830 Poster Session 1 and Reception (Veramendi Room)

Registration Desk Open All Times Meeting is in Session

Tuesday, 15 January 2002

0700 **Continental Breakfast** **El Cabildo Room**

Session 1: **PROGRAM OVERVIEWS / COST / TRAINING**
Session Chair: Vinod S. Agarwala **Co-Chair: Joseph M. Argento**

0830 **Overview of Air Force Corrosion Prevention and Control Program**
Major D. Bullock
Air Force Research Laboratory, Robins AFB, GA

0900 **The Implementation of Quality Assurance Training in Naval Ship Preservation Work**
N. Clayton and J. Duckworth
Naval Surface Warfare Center, Philadelphia, PA

0930 **Methodology for Acquiring and Assessing the Cost of Corrosion for U. S. Marine Corps Ground Vehicles and Selected Equipment**
M. Gallagher
Naval Surface Warfare Center, Philadelphia, PA

1000 **Break**

Session 1: **PROGRAM OVERVIEWS / COST / TRAINING (continued)**
Session Chair: Joseph M. Argento **Co-Chair: Vinod S. Agarwala**

1030 **Web Design for Information and Training in Corrosion Prevention & Control**
P. R. Roberge
Royal Military College of Canada, Kingston, Ontario, Canada

1100 **Fatigue Life, Corrosion and Safe-Life Issues**
B. Shafiq[1] and V. S. Agarwala[2]
[1]University of Puerto Rico, Mayagüez, Puerto Rico
[2]Naval Air Systems Command, Patuxent River, MD

Session 1: **POLLUTION PREVENTION / CASE STUDIES**
Session Chair: Joseph M. Argento **Co-Chair: Vinod S. Agarwala**

1130 **Green Corrosion Inhibitors**
V. S. Agarwala
Naval Air Systems Command, Patuxent River, MD

1200 **Lunch**

Session 1: **POLLUTION PREVENTION / CASE STUDIES (continued)**
Session Chair: Lynne M. Pfledderer **Co-Chair: Norm Clayton**

1330 **Cadmium Replacements for Defense Systems**
M. J. Kane
Naval Air Systems Command, Patuxent River, MD

1400 **Measurement of Volatile Organic Compounds (VOC'S) in New-Generation Low-VOC Marine Coatings for the U. S. Navy**
S. H. Lawrence[1], A.W. Webb[1], R. L. Foster[1], P. M. Bizot[2] and C. E. Bevans[2]
[1]U. S. Naval Research Laboratory, Washington, DC
[2]Geo-Centers, Clinton, MD

1430 **Pollution Prevention in Aerospace and DoD Painting Operations: Case Studies in Successful Elimination of MEK and Lacquer Thinner**
J. A. Lucas
Inland Technology, Inc., Tacoma, WA

1500 Break

Session 1: **POLLUTION PREVENTION / CASE STUDIES (continued)**
Session Chair: Norm Clayton Co-Chair: Lynne M. Pfledderer

1530 Compressors for the 21st Century
R. Miles
NCI Information Systems, Inc., Robins AFB, GA

1600 An Electronics Connector CPC Treatment that Raised Reliability as Much as 20X Saving Big Bucks
D. H. Horne
Hill AFB, UT

1630 The Operational Testing of the CPC ACF-50 on the U. S. Navy's S-3B Viking Fleet
E. G. Mullin
Naval Air Depot North Island, San Diego, CA

Session 2: **CORROSION CONTROL COATINGS: METALS**
Session Chair: Michael S. Donley Co-Chair: Richard C. Kinzie

0830 Development of Production-Scale Aluminum-Manganese Electrodeposition Process
E. Beck, M. J. Kane, C. Matzdorf and J. Green
Naval Air Systems Command, Patuxent River, MD

0900 Using Vanadium to Impart Self-Healing to Conversion Coatings for Aerospace Aluminum Alloys
M. T. Coolbaugh[1], H. P. Groger[1], E. C. Aquino[1], S. E. Morris[1], J. E. Roberts[1] and F. Pearlstein[2]
[1]American Research Corporation of Virginia, Radford, VA
[2]Philadelphia, PA

0930 Optimization of Zn to Ni Ratio in Zn-Ni-Cd Deposits
H. Kim, B. S. Haran and B. N. Popov
University of South Carolina, Columbia, SC

1000 Break

Session 2: **CORROSION CONTROL COATINGS: METALS (continued)**
Session Chair: Richard C. Kinzie Co-Chair: Michael S. Donley

1030 Corrosion and Adhesive Performance of Anodized Aluminum with Trivalent Chromium Post Treatment
C. Matzdorf, E. Beck and D. Bellevou
Naval Air Systems Command, Patuxent River, MD

1100 Metallizing for Corrosion Protection
D. H. Neale
NCI Information Systems, Inc., Decatur, GA

1130 Development of Corrosion and Hydrogen Permeation Resistant Zn-N-X (X=P, Cd) Ternary Alloys
B. N. Popov
University of South Carolina, Columbia, SC

1200 Lunch

Session 2: **CORROSION CONTROL COATINGS: METALS (continued) AND HEAT TREATMENTS & METALLURGY**
Session Chair: John A. Sedriks **Co-Chair: David A. Shifler**

1330 **Cerium-Based Conversion Coatings for Aluminum Alloys**
J. O. Stoffer, T. J. O'Keefe, M. J. O'Keefe, W. G. Fahrenholtz, T. P. Schuman, P. Yu, E. L. Morris, S. Hayes, S. Patwardhan, A. Williams and B. Rivera
University of Missouri-Rolla, Rolla, MO

1400 **Low Temperature Retrogression and Re-Aging Heat Treatments for Thick Section Components of Aluminum Alloy 7075 for Aging Aircraft Refurbishment**
C. P. Ferrer, M. G. Koul, B. J. Connolly and A. L. Moran
U. S. Naval Academy, Annapolis, MD

1430 **Effects of Hydrogen on the K_{IEAC} of High Strength Steel**
S. Grendahl and R. Kilbane
U. S. Army Research Laboratory, Aberdeen Proving Ground, MD

1500 **Break**

Session 2: **CORROSION CONTROL COATINGS: METALS AND HEAT TREATMENTS & METALLURGY (continued)**
Session Chair: Daniel A. Shifler **Co-Chair: A. John Sedriks**

1530 **Corrosion Protection Characteristics of New Sol-Gel Based Surface Treatments for AA2024-T3**
N. N. Voevodin[1], V. N. Balbyshev[2], A. J. Vreugdenhil[1], J. A. Johnson[3] and M. S. Donley[3]
[1]University of Dayton Research Institute, Dayton, OH
[2]Universal Technology Corporation, Dayton, OH
[3]Air Force Research Laboratory, Wright-Patterson AFB, OH

1600 **SCC and Corrosion Fatigue of HVOF Coated and Cr Plated AerMet 100 Steel**
E. U. Lee, H. C. Sanders and S. Hartle
Naval Air Warfare Center, Patuxent River, MD

1630 **SCC and Corrosion Fatigue of Laser Formed Ti-6Al-4V Alloy**
E. U. Lee and H. C. Sanders
Naval Air Warfare Center, Patuxent River, MD

Session 3: **AFOSR CORROSION PROGRAM REVIEW**
Session Chair: Paul C. Trulove

0815 **Welcome and Opening Remarks**
Lt. Col. Paul C. Trulove, AFOSR Program Manager, Arlington, VA

OSU MURI Final Review (0830 – 1130)

0830 **Inhibition of Oxygen Reduction by Chromate on AA2024-T3**
R. McCreery, G. Frankel, R. G. Buchheit, J. Ramsey and W. Clark
The Ohio State University, Columbus, OH

0930 **Cr(VI) Inhibition of Corrosion of Al Alloys**
M. Kendig, S. Jeanjaquet, R. Addison, J. Waldrop and M. Hon
Rockwell Scientific Company, Thousand Oaks, CA

1000 Break

1030 Mechanism of Al Alloy Corrosion and the Role of Chromate Inhibitors
G. S. Frankel
The Ohio State University, Columbus, OH

1130 Dioxygen Reduction at AA2024: Measurement of the Reaction and Influence of Adsorbates
J. Seegmiller and D. A. Buttry
University of Wyoming, Laramie, WY

1200 Lunch

NDSU URI Annual Review (1330 – 1630)

1330 Aircraft Coatings Testing, Corrosion Sensors in Coatings and Mg-Rich Coatings as Cr-free Primers for Al 2024 T-3
G. P. Bierwagen, S. Mabbutt, L. He, X. Wang, M. Nanna, L. Ellingson and D. Tallman
North Dakota State University, Fargo, ND

1400 Electrodeposition of Conducting Polymer Coatings on Active Metals using Electron Transfer Mediation
D. E. Tallman[1], C. Vang[1], T. Underdahl[1], G. G. Wallace[2] and G. P. Bierwagen[1]
[1]North Dakota State University, Fargo, ND
[2]University of Wollongong, Wollongong, Australia

1430 Quantitative Use of Spectroscopy and Effective Irradiation Dosage During Weathering
S. G. Croll and A. D. Skaja
North Dakota State University, Fargo, ND

1500 Break

1530 Application of Multi-Rate Signal Processing to Electrochemical Instrumentation
D. C. Farden
North Dakota State University, Fargo, ND

1600 Evaluation of Functionalized Polysiloxanes as Aircraft Coating Primers
P. Boudjouk, T. E. Ready and S.-B. Choi
North Dakota State University, Fargo, ND

1630 Local Chemistry, Electrochemistry and Corrosion Topography within Coating Defects
O. M. Schneider, J. M. Williams and R. G. Kelly
University of Virginia, Charlottesville, VA

Wednesday, 16 January 2002

0700 **Continental Breakfast** **El Cabildo Room**

Session 1: **POLLUTION PREVENTION / CASE STUDIES**
Session Chair: Sid Markowitz **Co-Chair: E. Dail Thomas**

0830 **Failure Analysis of a HH-60 Helicopter External Fuel-Tank Pylon**
J. A. Newman[1] and R. S. Piascik[2]
[1]U. S. Army Research Laboratory, Hampton, VA
[2]NASA Langley Research Center, Hampton, VA

0900 **Integrated Corrosion and Material Degradation Prevention Solutions-Enhancing Readiness, Protecting Equipment, Preventing Pollution, and Lowering Life-Cycle Cost**
J. Martin
Logis-Tech Inc., Alexandria, VA

Session 1: **CORROSION DETECTION**
Session Chair: Sid Markowitz **Co-Chair: E. Dail Thomas**

0930 **Advanced Preservation Technologies Reduce Unit Workload**
E. D. Thomas
Naval Sea Systems Command, Washington Navy Yard, DC

1000 **Break**

Session 1: **CORROSION DETECTION (continued)**
Session Chair: E. Dail Thomas **Co-Chair: Sid Markowitz**

1030 **Corrosion Sensing and Monitoring**
C. S. Brossia, L. T. Yang, D. S. Dunn and N. Sridhar
Southwest Research Institute, San Antonio, TX

1100 **Fluorescent Indicator for the Detection of Corrosion Under Coatings**
J. D. Garmany
Systems & Processes Engineering Corporation, Austin, TX

1130 **A Microwave Corrosion Detector for Inspecting Under Aircraft Paints and Appliqués**
A. V. Bray and G. R. Schmidt
Systems and Materials Research Consultancy, Spicewood, TX

1200 **Open Afternoon**

Session 2: **HEAT TREATMENTS AND METALLURGY**
Session Chair: Chris L. Vickers **Co-Chair: Stephen L. Szaruga**

0830 **Corrosion Behavior of Friction Stir Welded High Strength Aluminum Alloys**
J. B. Lumsden, M. W. Mahoney and G. A. Pollock
Rockwell Scientific, Thousand Oaks, CA

0900 **Strength, Microstructure and Corrosion Behavior of Friction Stir Welded 7075-T6**
C. S. Paglia, B. C. Pitts and R. G. Buchheit
The Ohio State University, Columbus, OH

0930 **Contributions of Hot Corrosion and Diffusional Processes Towards the Performance of High Temperature Materials**
D. A. Shifler
Naval Surface Warfare Center, West Bethesda, MD

1000 **Break**

Session 2: **HEAT TREATMENTS AND METALLURGY (continued)**
Session Chair: Stephen L. Szaruga Co-Chair: Chris L. Vickers

1030 **The Effect of Artificial Heat Treatment on the Chromate Conversion Performance of Al-Zn-Mg-Cu Alloy**
Y. Yoon and R. G. Buchheit
The Ohio State University, Columbus, OH

Session 2: **EVALUATION OF CORROSION CONTROL COATINGS**
Session Chair: Stephen L. Szaruga Co-Chair: Chris L. Vickers

1100 **Evaluation of Technical Performance of Aluminum-Manganese Electrodeposition**
E. Beck, M. J. Kane, C. Matzdorf and J. Green
Naval Air Systems Command, Patuxent River, MD

1130 **Outdoor Exposure Performance of Non-Chromate Pretreatments on Aluminum Armor Alloys**
J. V. Kelley and B. E. Placzankis
U. S. Army Research Laboratory, Aberdeen Proving Ground, MD

1200 **Open Afternoon**

Session 3: **AFOSR CORROSION PROGRAM REVIEW**
Session Chair: Paul C. Trulove

ASU MURI Final Review (0830 – 0930)

0830 **De-alloying and Corrosion of Al Alloy 2024-T3**
M. B. Vukmirovic, N. Dimitrov and K. Sieradzki
Arizona State University, Tempe, AZ

0930 **Self-Assembled NAno-phase Particle (SNAP) Sol-Gel Surface Treatments for Aerospace Aluminum Alloys**
M. S. Donley[1], V. N. Balbyshev[2], L. S. Kasten[3] and D. J. Gaspar[4]
[1]Air Force Research Laboratory, Wright-Patterson AFB, OH
[2]Universal Technology Corporation, Dayton, OH
[3]University of Dayton Research Institute, Dayton, OH
[4]Pacific Northwest National Laboratory, Richland, WA

1000 Break

1030 **Permanent Foundation Layer Research**
J. Johnson, T. Dang, M. Donley, N. Voevodin, and M. Khobaib
Air Force Research Laboratory, Wright-Patterson AFB, OH 45433-7750

1100 **Nanophase Silicon Sol-gel Coatings with Variable Organic Content for Corrosion Protection of AL Alloys**
V. N. Balbyshev[1], A. N. Khramov[1], A. J. Vreugdenhil[2] and M. S. Donley[3]
[1]Universal Technology Corporation, Dayton, OH
[2]University of Dayton Research Institute, Dayton, OH
[3]Air Force Research Laboratory, Wright-Patterson AFB, OH

1130 **Spectroscopic Investigation of SNAP Solution Chemistry**
R. A. Mantz[1], V. N. Balbyshev[2] and M. S. Donley[1]
[1]Air Force Research Laboratory, Wright-Patterson AFB, OH
[2]Universal Technology Corporation, Dayton, OH

1200 Open Afternoon

1830 **Poster Session 2 (Veramendi Room)**

Thursday, 17 January 2002

0700 **Continental Breakfast** **El Cabildo Room**

Session 1: **CORROSION DETECTION**
Session Chair: James H. Kovanda **Co-Chair: Keith E. Lucas**

0830 **Corrosion Detection and Prioritization using Scanning and Permanently Mountable MWM Eddy Current Arrays**
N. Goldfine[1], D. Grundy[1], V. Zilberstein[1], D. Schlicker[1], Y. Sheiretov[1], A. Washabaugh[1], K. LaCivita[2], V. Champagne[3], and P. Sincebaugh[3]
[1]JENTEK Sensors, Inc., Waltham, MA
[2]Air Force Research Laboratory, Wright-Patterson AFB, OH
[3]United States Army Material Technology Laboratory, Aberdeen Proving Ground, MD

0900 **The Corrosive Environment Monitoring Systems (CEMS): An Innovative Technique for Monitoring and Preventing the Formation of Corrosion on Aircraft Structure**
J. G. Moffatt[1], F. S. Malver[2] and S. Menon[2]
[1]U. S. Army Aviation Applied Technology Directorate, Ft. Eustis, VA
[2]Honeywell Inc., Minneapolis, MN

0930 **New Technological Challenges for Ultrasonic Guided Wave NDE**
J. L. Rose and T. Hay
The Pennsylvania State University, University Park, PA

1000 **Break**

Session 1: **CORROSION DETECTION (continued)**
Session Chair: Keith E. Lucas **Co-Chair: James H. Kovanda**

1030 **Application of Remote-Field Eddy-Current Technique to Aircraft Corrosion Detection**
Y. Sun and T. Ouyang
Innovative Materials Testing Technologies, Inc., Ames, IA

1100 *An Approach for Corrosion Classification based on Wavelet Analysis*
A. Verma, A. Ibragimov and R. Mayer
Knowledge Based Systems, Inc., College Station, TX

Session 1: **CLEANING / TESTING**
Session Chair: Keith E. Lucas **Co-Chair: James H. Kovanda**

1130 **The Effects of Chemical Wash Additives on the Corrosion of Aerospace Alloys in Marine Atmospheres**
R. H. Heidersbach[1], L. MacDowell[2], J. Curran[3] and R. Barile[3]
[1]California Polytechnic State University, San Luis Obispo, CA
[2]NASA, Kennedy Space Center, FL
[3]Dynacs, Inc., Kennedy Space Center, FL

1200 **Lunch**

Session 1: **CLEANING / TESTING (continued)**
Session Chair: William P. Hoogsteden **Co-Chair: Edward J. Lemieux**

1330 **Cleaning Chemistries and their Contributions to Corrosion Problems**
J. A. Lucas
Inland Technology, Inc., Tacoma, WA

1400 **Solving the Aqueous Parts Washer Problem**
R. Miles
NCI Information Systems, Inc., Robins AFB, GA

1430 **Effects of Testing Tank Geometry and Material on ICCP System Design**
S. A. Wimmer[1], V. G. DeGiorgi[2], E. Hogan[2] and K. E. Lucas[2]
[1]Nova Research, Alexandria, VA
[2]Naval Research Laboratory, Washington, DC

1500 **Break**

Session 1: **CORROSION CONTROL COATINGS: POLYMERS**
Session Chair: Edward J. Lemieux **Co-Chair: William P. Hoogsteden**

1530 **New Electroactive Polymers May Replace Hexavalent Chromium and Cadmium in Corrosion Control Coatings**
N. Anderson, J. Stenger-Smith, D. Irvin, A. Guenthner and P. Zarras
Naval Air Warfare Center, China Lake, CA

1600 **Dual Use Interior Direct-To-Metal/Exterior Chemical Agent Resistant Coating Primer**
A. Eng, D. Fayocavitz, S. Murray, F. Pilgrim and L. Weiser
Naval Surface Warfare Center, Philadelphia, PA

1630 **Polarization Behavior and Corrosion-Initiation Mechanisms of Mo Coated With Amorphous Hydrogenated Silicon Alloy Thin Ceramic Films**
L. H. Hihara, A. S. Iwane and R. E. Rocheleau
University of Hawaii at Manoa, Honolulu, HI

1900-2200 **Dinner Buffet (included in registration)** **Speaker: TBD** **Iberian Ballroom**

Session 2: **EVALUATION OF CORROSION CONTROL COATINGS**
Session Chair: John V. Kelley **Co-Chair: Joel A. Johnson**

0830 **Evaluation of Zinc-Rich Primers for use on Army Vehicle Systems**
I. C. Handsy[1] and J. Repp[2]
[1]U. S. Army Tank-Automotive Armaments Command, Warren, MI
[2]Corrpro Companies, Inc., Ocean City, NJ

0900 **Painted Corrosion Performance of Non-Chromate Aluminum Pretreatments Exposed to SO_2 Salt Fog**
C. Matzdorf
Naval Air Systems Command, Patuxent River, MD

0930 **Atmospheric Exposure and Salt Fog Studies of the Corrosion Behavior of Electrodeposited Hard Chromium and HVOF Thermal Spray Coatings**
P. M. Natishan[1], S. H. Lawrence[1], R. L. Foster[2], and B. D. Sartwell[1]
[1]Naval Research Laboratory, Washington, DC
[2]Naval Research Laboratory, Key West, FL

1000 **Break**

Session 2: **EVALUATION OF CORROSION CONTROL COATINGS (continued)**
Session Chair: Joel A. Johnson **Co-Chair: John V. Kelley**

1030 **Analysis of Nonchromate Conversion Coatings on Aluminum Alloys 2024, 5083, and 7075 Coated with DoD Coatings using GM 9540P Cyclic Accelerated Corrosion Exposure**
B. E. Placzankis[1], C. E. Miller[1], and C. A. Matzdorf[2]
[1]U. S. Army Research Laboratory, Aberdeen Proving Ground, MD
[2]Naval Air Systems Command, Patuxent River, MD

1100 **Low Volatile Organic Compound (VOC) Chemical Agent Resistant Coating (CARC) Application Demonstration/Validation**
L. Weiser, A. Eng, D. Fayocavitz and F. Pilgrim
Naval Surface Warfare Center, Philadelphia, PA

Session 2: **CORROSION CHARACTERIZATION**
Session Chair: Joel A. Johnson **Co-Chair: John V. Kelley**

1130 **Corrosion of AA2024-T3 under Protective Coatings**
M. Khobaib[1], A. Mahan[1] and M. S. Donley[2]
[1]University of Dayton Research Institute, Dayton, OH
[2]Air Force Research Laboratory, Wright-Patterson AFB, OH

1200 **Lunch**

Session 2: **CORROSION CHARACTERIZATION (continued)**
Session Chair: Robert A. Mantz **Co-Chair: Brian E. Placzanski**

1330 **Galvanic Behavior Database for Titanium-Steel Alloy Couples**
R. P. I. Adler, B. E. Placzankis and C. E. Miller
U. S. Army Research Laboratory, Aberdeen Proving Ground, MD

1400 **Ion Beam Analysis Techniques for the Study of Material Surface Degradation**
J. D. Demaree and J. K. Hirvonen
U. S. Army Research Laboratory, Aberdeen Proving Ground, MD

1430 **U. S. Army Experience with Corrosion Assessment and Analysis in Rotorcraft**
K. S. Rees
U. S. Army Aviation & Missile Command, Corpus Christi, TX

1500 **Break**

Session 2: **CORROSION CHARACTERIZATION (continued)**
Session Chair: Brian E. Placzankis **Co-Chair: Robert A. Mantz**

1530 **The Influence of Fuel Carbon Residue on Hot Corrosion**
D. A. Shifler
Naval Surface Warfare Center, West Bethesda, MD

1600 *Effect of Orientation on Fatigue Crack Initiation from Corrosion Damage*
M. Khobaib[1], C. Kacmar[1], and M. Donley[2]
[1]University of Dayton Research Institute, Dayton, OH
[2]Air Force Research Laboratory, Wright-Patterson AFB, OH

1630 **Role of Thiols in Inhibiting Corrosion of AA2024-T3**
M. Khobaib[1], N. Voevodin[1], L. Kasten[1], J. Grant[1] and M. S. Donley[2]
[1]University of Dayton Research Institute, Dayton, OH
[2]Air Force Research Laboratories, Wright-Patterson AFB, OH

1900-2200 **Dinner Buffet (included in registration)** **Speaker: TBD** **Iberian Ballroom**

Session 3: **AFOSR CORROSION PROGRAM REVIEW**
Session Chair: Paul C. Trulove

0830 **Acoustic and Thermal NDE Techniques for Characterization of Polymeric Coatings and Detection of Localized Corrosion**
N. Meyendorf, J. Hoffmann, M. Khobaib, U. Netzelmann and S. Sathish
University of Dayton Research Institute, Dayton, OH

UVA MURI 1st Annual Review (0900 – 1630)

0900 **The Development of a Multi-Functional Coating for Aerospace Applications using Molecular- and Nano-Engineering Methods: A MURI Overview**
S. R. Taylor[1], J. R. Scully[1], R. G. Kelly[1], G. J. Shiflet[1], R. G. Buchheit[2], W. J. van Ooij[3], C. J. Brinker[4], K. Sieradzki[5] and A. L. Moran[6]
[1]University of Virginia, Charlottesville, VA
[2]The Ohio State University, Columbus, OH
[3]University of Cincinnati, Cincinnati, OH,
[4]University of New Mexico, Albuquerque, NM
[5]Arizona State University, Tempe, AZ
[6]U. S. Naval Academy, Annapolis, MD

0930 **Opportunities for Nano-Structured 'Sol-Gel-Derived' Materials in Corrosion Inhibition**
C. J. Brinker
University of New Mexico-Sandia National Laboratories, Albuquerque, NM

1000 Break

1030 **Synthesis and Devitrification of New Al-based Metallic Glass Coatings**
G. J. Shiflet
University of Virginia, Charlottesville, VA

1100 **The Discovery of New Corrosion Inhibitors using Combinatorial Methods,**
S. R. Taylor[1], C. A. Marks[1], B. D. Chambers[1] and M. W. Kendig[2],
[1]University of Virginia, Charlottesville, VA
[2]Rockwell International, Thousand Oaks, CA

1130 **Corrosion Protection of AA 2024-T3 by Organofunctional Silanes**
W. J. van Ooij, A. Lamar and D. Zhu
University of Cincinnati, Cincinnati, OH

1200 Lunch

1330 **Photonic Crystal Structures as Nanoengineered Coatings**
K. Sieradzki
Arizona State University, Tempe, AZ

1430 **Organic Coating Pigments for Corrosion Resistance and Corrosion Sensing**
H. Guan and R. G. Buchheit
The Ohio State University, Columbus, OH

1500 Break

1530 **Thermal Sprayed Aluminum Alloy Cladding for Aircraft Skin Replacements**
A. L. Moran[1], B. J. Connolly[1] and R. McCaw[2]
[1]United States Naval Academy, Annapolis, MD
[2]Naval Surface Warfare Center, Bethesda, MD

1600 **Localized Corrosion Resistance of Selected Al-TM-RE Alloys as a Function of the Degree of Crystallinity**
J. R. Scully, A. M. Lucente and J. E. Sweitzer
University of Virginia, Charlottesville, VA

1630 **The Development of an Admicellar Polymerization Process for Depositing Coatings on Aluminum Alloys and Crevices**
O. Matarredona, K. Mach, S. Merchant, E. O'Rear and M. Rieger
University of Oklahoma, Norman, OK

1900-2200	Dinner Buffet (included in registration)	Speaker: TBD	Iberian Ballroom

Friday, 18 January 2002

0700 **Continental Breakfast** **El Cabildo Room**

Session 1: **CORROSION CONTROL COATINGS: POLYMERS**
Session Chair: Wayne W. Ziegler **Co-Chair: Christopher E. Miller**

0830 **High-Performance Low Solar Absorbance (LSA) Coatings**
A. G. Holder[1] and R. F. Brady, Jr.[2]
[1]Naval Surface Weapons Center, Bethesda, MD
[2]Naval Research Laboratory, Washington, DC

0900 **Corrosion Behavior of Corrosion Resistant Alloys and Zinc Rich Primers**
E. J. Lemieux[1], J. R. Martin[1], K. E. Lucas[2] and A. Webb[2]
[1]Naval Research Laboratory, Key West, FL
[2]Naval Research Laboratory, Washington, DC

0930 *Performance of Direct to Metal Primers in Accelerated Environments*
C. Miller and B. Placzankis
Army Research Laboratory, Aberdeen Proving Ground, MD

1000 **Break**

Session 1: **CORROSION CONTROL COATINGS: POLYMERS (continued)**
Session Chair: Christopher E. Miller **Co-Chair: Wayne W. Ziegler**

1030 **Advanced Coatings Systems for Corrosion Protection of Air Force Aircraft**
J. H. Osborne
The Boeing Company - Phantom Works, Seattle, WA

1100 **Advanced Thin Film Fluoropolymers – Versatile Weapons in the Navy and Marine Corps Battle Against Corrosion**
T. G. Vargo and A. W. Dalgleish
Integument Technologies, Inc., Tonawanda, NY

1130 **Cold Spray Technology for Military Applications**
W. Ziegler and V. Champagne
Army Research Laboratory, Aberdeen Proving Ground, MD

1200 **END**

Session 2: **CORROSION CHARACTERIZATION**
Session Chair: Steven F. Carr **Co-Chair: Kevin J. Kovaleski**

0830 **Understanding the Mechanisms of Degradation of Military Coatings using Electrochemical Impedance Spectroscopy (EIS)**
K. J. Kovaleski, W. Kosik, T. Eng, S. McKnight, C. Clayton, G. Halada, L. Keene and G. Kendall
Naval Air Systems Command, Patuxent River, MD

0900 **The Applicability of EIS for Assessing Substrate Metal Mass Loss for Polymer-Coated Metals**
D. B. Mitton[1], S. L. Wallace[1], N. J. Cantini[1], N. Eliaz[1], R. M. Latanision[1], F. Bellucci[2] and G. E. Thompson[3]
[1]Massachusetts Institute of Technology, Cambridge, MA
[2]University of Naples Federico II, Naples, Italy
[3]University of Manchester Institute of Science and Technology, Manchester, UK

0930 **The Function of Admixed Corrosion Inhibitors in Steel Reinforced Concrete**
F. J. Martin and J. Olek
Purdue University, West Lafayette, IN

1000 **Break**

Session 2: **CORROSION CHARACTERIZATION (continued)**
Session Chair: Kevin J. Kovaleski Co-Chair: Steven F. Carr

1030 **An Examination of Degradation Modes of Constructional Materials for Supercritical Water Oxidation System Fabrication**
D. B. Mitton, H. Kim, J. Zhang and R. M. Latanision
Massachusetts Institute of Technology, Cambridge, MA

1100 *Rotating Disk Studies of Iron Corrosion in Water under Abiotic and Biotic Conditions*
B. Pesic
University of Idaho, Moscow, ID

1130 *The Role of Marine Bacteria in Stainless Steel Pitting*
R. I. Ray and B. Little
Naval Research Laboratory, Stennis Space Center, MS

1200 **END**

Session 3: **AFOSR CORROSION PROGRAM REVIEW**
Session Chair: Paul C. Trulove

UMinn MURI 1st Annual Review (0830 – 1000)

0830 **Transient Transport in Flake-filled Coatings used for Corrosion Prevention**
N. K. Lape, W. H. Smyrl and E. L. Cussler
University of Minnesota, Minneapolis, MN

0900 **Flake Alignment in Composite Coatings**
C. Yang[1], A. Crasto[2] and E. L. Cussler[1]
[1]University of Minnesota, Minneapolis, MN
[2]University of Dayton Research Institute, Dayton, OH

0930 **Synthesis of Self-assembled NAnoParticles (SNAP) from Alkoxysilane Solutions**
R. Makote, M. Khobaib and C. Chen
University of Dayton Research Institute, Dayton, OH

1000 **Break**

1030 **Measurement of Localized Corrosion Propagation Rates in Al and Al Alloys**
G. S. Frankel
The Ohio State University, Columbus, OH

1100 **The Role of Coating Heterogeneities in the Long-Term Performance of Coated Aluminum Alloys**
S. R. Taylor, P. Moongkhamklang and A. M. Mierisch
University of Virginia, Charlottesville, VA

1130 **The Role(s) of Alloy Heterogeneity and Composition in the Under Paint Corrosion of Aluminum Alloys**
J. R. Scully and D. A. Little
University of Virginia, Charlottesville, VA

1200 **END**

ANNUAL REPORT

CHEMISTRY AND LIFE SCIENCES RESEARCH PROGRAM

CONTRACT NO. F49620-00-C-0009

Period of Performance: 3/1/00 – 2/28/01

Prepared For:

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

CHEMISTRY AND LIFE SCIENCES DIRECTORATE

Dr. Genevieve Haddad, Program Manager

Presented By:

UES, Inc.
4401 Dayton-Xenia Road
Dayton, OH 45432-1894

INTRODUCTION

UES, Inc. is providing research evaluation services to the Directorate of Chemistry and Life Sciences, Air Force Office of Scientific Research (AFOSR), in subareas that include Neurosciences (e.g., Neurochemistry, Biology, Electrophysiology, Neuroanatomy, Multisensory Integration/Spatial Orientation, Cardiovascular Physilogy, and Bioenvironmental Hazards; Psychophysics, Psychophysiology, Physiological Psychology, Sensation, Perception, Cognition); Computer Sciences (e.g., Vision and Robotics); Otolaryngology; Meteorology, Chemistry (e.g., computational chemistry, polymeric and organic materials, photonic materials, inorganic and surface chemistry, high density materials); Biotechnology (e.g., materials and processes); and Fuels (e.g., petroleum and synthetic); and in related programs under development.

The services provided by UES, Inc. include: selecting qualified scientists to evaluate proposals, assembling scientific groups to evaluate, analyze and advise on content and direction of Chemistry and Life Sciences Programs; organizing workshops to assist in the definition of new basic research areas proposed by the Chemistry and Life Sciences Directorate; providing advisors to make presentations and assist government personnel with analyzing areas of relevant science; and providing advisors to assist and advise on site visits to research laboratories.

The fifth option year included: 107 Proposals that were reviewed;
4 Program/Contractor Reviews and 4 Workshops.

A. Evaluations of Individual Research Proposals

UES sent out 107 proposals to evaluators during the performance period of 1 March 2000 through 28 February 2001.

UES has been providing the Director of Chemistry and Life Sciences a Summary of Proposals Under Review (SPUR) report on a biweekly basis. This report is now being sent electronically as well as a hard copy. This report is composed of the UES log sheet indicating the proposals sent out, the names of the evaluators to whom the proposals were sent, the dates the proposals were mailed, the tickle date, any necessary comments, and the date the reviews were received. This allows the Program Managers to have a current listing of all proposal activity.

B. Contractor/Program Reviews

1. The first program review was **Polymer Matrix Composite** Program Review, Courtyard at Marriott, Long Beach, CA, 19 - 20 May 2000
speakers :
attendees:

2. The second program review was **Photorefractive Polymer** Program Review, Hilton Gaslamp Quarter, San Diego, CA, 27 - 28 July 2000.

Speakers:
Attendees:

3. The third program review was **Corrosion** and **MURI** Program Reviews, Hawk's Cay Resort, Duck Key, FL 28 January – 9 February 2001.
Speakers: 35
Attendees: 78

4. The fourth program review was AFOSR/ONR **Electrochemistry Science & Technology** Program Review, Loews Annapolis Hotel, Annapolis, MD, 19 - 21 February 2001.
Speakers: 23
Attendees: 47

C. Workshops

1. **Biotech** Workshop, Crowne Plaza, Dayton, OH, 11-13 July 2000.

2. **Polymers for AF Lightweight/Affordable Radar System** Workshop, Hyatt Rosemont, Rosemont, IL, 7 - 8 December 2000.

3. **Biologically Based Materials** Workshop, Tradewinds Sandpiper Hotel, St. Petersburg Beach, FL, 18 - 19 January 2001.

4. **Dip-Pen Nanolithography** Workshop, Hawk's Cay Resort, Duck Key, FL 28 January – 9 February 2001. 51 participants

D. Advisors

In addition to advisors provided for Program Reviews, Workshops and Panel Meetings, UES provided travel, per diem and in many cases, honorarium for the following advisors:

Priya Vashinshta and Ann Chaka, **Molecular/Material Modeling,** Washington, DC, 12-14 March 2000.

Madhu Madhukar and John Halpin, **Polymer Composite,** Long Beach, CA, 19-20 May 2000.

George Sperling, Zhong-Lin-Lu, Sylvan Kornblum, Randall Engle, Patrick Cavanagh, Marvin Chun, Ken Nakayama, Jermy Wolfe, Eileen Kowler, Barbara Dosher and D. Martin Regan, **Human Attention Processes,** , 25-26 May 2000.

Mark Berg, Laurie Butler, Steven Bernasek, James Coe, Jimmie Doll, Bruce Garrett, James Lisy, Charles Parmenter and Jack Simons, **Molecular Dynamics/Theoretical Chemistry Panel,** Waltham, Boston, 24-25 May 2000.

Graham Candler and Iain Boyd, **Molecular Dynamics/Theoretical Chemistry Contractor's Review,** Waltham, Boston, 21-24 May 2000.

David Golden, **International Combustion Symposium,** Edinburgh, Scotland, 30 July through 4 August 2000.

Alexander Benderskii, **HEDM Contractor's Conference,** Park City, UT, 24-26 October 2000.

Tim Smith and Joel Smith, **Radiofrequency Bioeffects Workshop,** San Antonio, TX on 20 September 2000.

Cindy Afshari, Antje Baeumner, Evan Steeg, Nicholas Abbott, Thomas Baker, Henry Sze, Roger Ulrich and Brian Halsall, **Biotechnology Workshop,** Dayton, OH, 11-13 July 2000.

James R. Lackner and Willard Larkin, **Spatial Disorientation Workshop,** San Antonio, Texas, 15-17 November 2000.

Lawrence Wolff and Diego Socolinsky, **Symposium for Applications of Human ID,** NIST, Gaithersburg, MD, 19-21 September 2000.

Duane A. Adams, **Information Fusion,** Arlington, VA, 18-20 October 2000.

Willard Larkin, **PRET Review,** University of Pennsylvania Philadelphia October 2000.

John H. Beatty, Bob Racicot, Patrick Moran, Steven McKnight, Patrick Hagans and Hugh De Long, **Corrosion Program Review**, Duck Key, FL, 29 January – 2 February 2001.

SUMMARY

UES is pleased to continue to perform the specific tasks assigned to them in accordance with provisions of the contract. Participants will continue to be Dr. Thomas Eggemeier as Program Manager, Judith M. Flory, Program Administrative Manager and Ann Corbitt as Program Assistant. UES personnel appreciate the opportunity to be of service to AFOSR in this interesting and worthwhile program.

LIST OF APPENDICES

BREAKDOWN OF RESEARCH PROPOSALS BY PROGRAM MANAGER

PROGRAM MANAGER	NO. OF PROPOSALS
Berman	31
Cohn	6
Kozumbo	15
Larkin	21
Lee	14
Tangney	10
Trulove	10